THE
EVOLUTION OF GEOGRAPHY

JOHN KEANE

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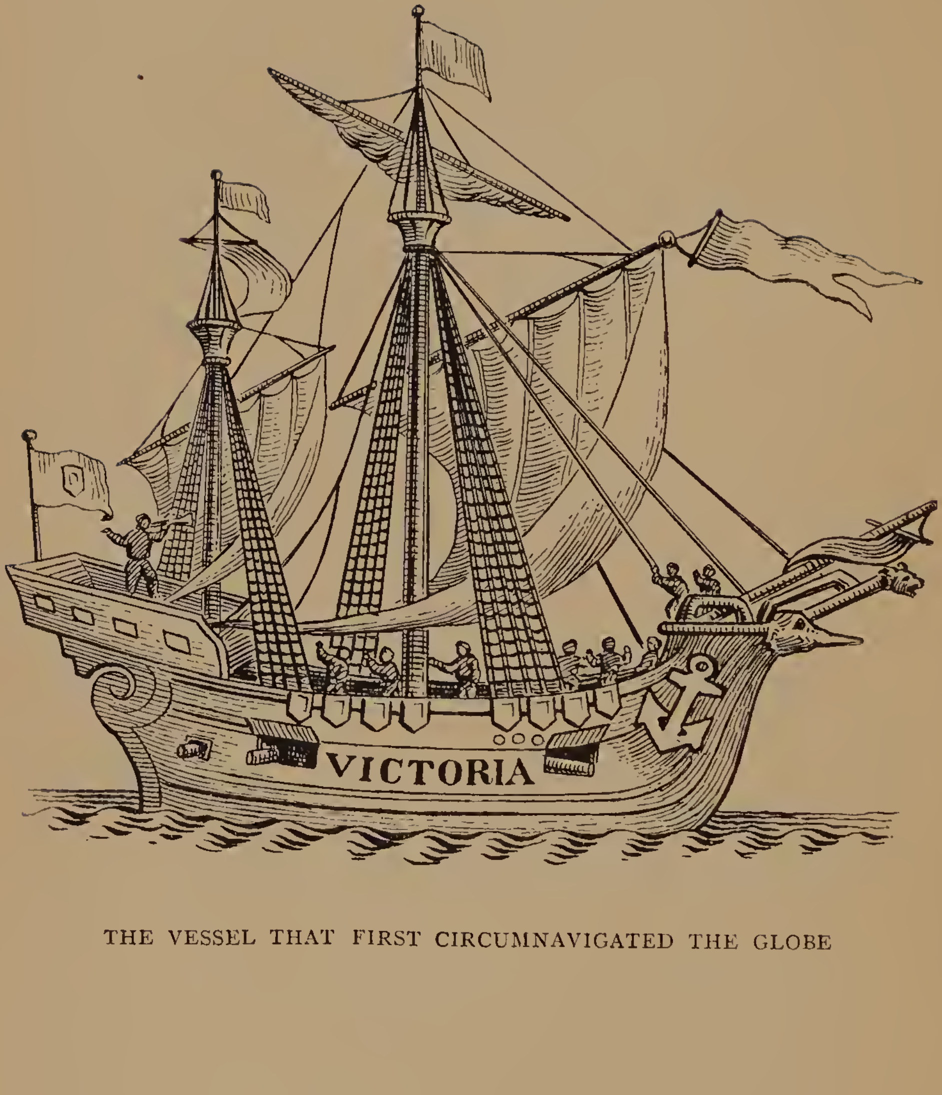
THE

EVOLUTION OF GEOGRAPHY



THE VESSEL THAT FIRST CIRCUMNAVIGATED THE GLOBE

THE

EVOLUTION OF GEOGRAPHY

A SKETCH OF THE
RISE AND PROGRESS OF GEOGRAPHICAL KNOWLEDGE
FROM THE EARLIEST TIMES TO THE FIRST
CIRCUMNAVIGATION OF THE GLOBE

BY

JOHN KEANE

'There is no part of history so generally useful as that which relates to the progress of the human mind, the gradual improvement of reason, the successive advances of science, the vicissitudes of learning and ignorance, which are the light and darkness of thinking beings, the extinction and resuscitation of arts, and the revolutions of the intellectual world.'—DR. JOHNSON: *Rasselas*

Of voyages and travels I would have good store, especially the earlier, when the world was fresh and unhackneyed, and men saw things invisible to the modern eye.'—JAMES RUSSELL LOWELL

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TO
THE LADY FREDERICK CAVENDISH

PREFACE

THE picture I have endeavoured to sketch in the following pages aims at being nothing more than a sketch, yet I trust that the essential features of a very interesting and wonderful story have been portrayed. For it *is* wonderful, this rise and fall, ebb and flow, of human knowledge evidenced by men's ideas of Mother Earth; a knowledge that rises often to something approaching perfection, only to be thrown back, time after time, on older and crude ideas. We never know when those ideas are dead. And it is only after the first circumnavigation of the globe that we start with an assured amount of common knowledge embodying our modern scientific ideas. With this climax I fittingly end the first part of my story. The work of Magellan in 1520 brings us only to the threshold of the sixteenth century—a century of important results to England and to western Europe generally. But the story of what led to those results, the slow growth of 'earth-knowledge' through the centuries preceding the Renaissance, is of the utmost importance if we would rightly understand and appreciate the significance of the later growth and expansion. It is precisely this earlier part this germinating of the seed, that is not nearly so well known as it should be. It is difficult for us to-day, with our cable-belted globe, to realise the halting and laborious steps by which we have advanced to our vast inheritance. But, just as the ability to walk is the result of a child's earlier attempts and experiments, so is geographical knowledge at its most brilliant period the result of many centuries of preparation. Nor are these earlier times devoid of promise: we see glimmerings of what is to come; the dawn has beauties of its own if it cannot compare with the splendour of the noontide, and similarly the childhood of geography has a colouring, a glamour, which the later period of development does not possess.

The scope of this little work, then, is to trace the development of geographical ideas and knowledge from their very infancy. And though, naturally, the data are meagre to start with, they augment as we proceed, and in the result may be said to epitomise the history of human thought. But the great achievements in the discovery of the world are so essentially the work of western Europe—following on the ages of preparation—that, when traced back to their inception, they condense the story of European civilisation. We are concerned with this European civilisation from the very beginning of our survey, and for centuries we follow its circulation round the shores of the Mediterranean, a veritable world-centre in bright relief, shading off into haze and deep gloom. I have borne this fact in mind, therefore, in the preparation of this work, and have subordinated such elements as the Arab and Mongolian irruptions for example, treating of them only so far as necessary in order to fully understand their effect on the later western work.

I can only hope that, in selecting from a mass of materials, I have chosen such facts as will prove of real value to my readers. The Appendix, while indicating the books I have found of most assistance, will serve as a guide to those who wish to pursue the story more fully, if not already acquainted with these works. The majority of my authorities, it will be seen, are within the reach of all, since they are to be found in almost every public library.

In the preparation of the maps I have had the invaluable assistance of Mr. Stanford's cartographer, Mr. Bolton, and I am indebted to him for several hints whilst the work was going through the press. The series of maps, embracing more than 2,000 years of geographical history, so far as I am aware has never previously been included in a single volume. The Juan de la Cosa map—the earliest known map of the New World—is now, I believe, for the first time reproduced *in its entirety* on a small scale.

I have to thank Mr. John Murray for having kindly permitted the use of the first three maps, illustrating ancient classical geography, from Sir Edward Bunbury's 'History of Ancient Geography,' and the Albi mappemonde and the Strassburg map from Mr. C. Raymond Beazley's 'Dawn of Modern Geography.' I have also to thank Messrs. G. P. Putnam's Sons for the portrait of Columbus, and Messrs. George Philip and Son for that of Magellan.

J. K.

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THE VESSEL THAT FIRST CIRCUMNAVIGATED THE GLOBE . . . . *Frontispiece*

The original drawing forms the frontispiece to Part VI. of a collection of voyages published by Levinus Hulsius, a mathematician and geographer, printed at Nuremberg in 1602.

In the four corners of the original are portraits of Ferdinand Magellan with the date 1520, Sebastian del Cano 1521, Sir Francis Drake 1577, and Olivier van Noort 1601. There are also two shields, one with a crude map of Magellan's Straits, the other with the arms of Sebastian del Cano, viz. a globe with the words *Primus me circumdedisti.* Four lines of a Latin verse are above the *Victoria*, and one below it.

PRINCE HENRY THE NAVIGATOR 85

The original portrait is in a contemporary manuscript chronicle, now in the National Library at Paris, viz., Azurara's 'Discovery and Conquest of Guinea,' and is the only known authentic likeness. It represents the Prince in mourning for the death of his brother Dom Pedro, 'the Traveller,' who died in 1449. Major says of this portrait: 'The original miniature in the manuscript is the only authentic portrait of Prince Henry which the Portuguese possess. The Prince is represented dressed in mourning, his head covered with the large barret cap without any insignia, and his hair cut short according to the custom.'

THE ASTROLABE 95

This is taken from a work by Joseph Moxon, 'A Tutor to Astronomie and Geographie; or an easie and speedy way to know the use of both Globes, Celestial and Terrestrial,' printed by the author, 'and sold at his Shop on Corn-hill, at the signe of Atlas,' in 1695. Moxon was appointed hydrographer to Charles II. shortly after 1660, probably obtaining the post through his friendship with Samuel Pepys, who had been appointed secretary of the 'navy board' in July 1660. Besides writing books on navigation, Moxon was a maker of naviga-

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tion instruments, and we may therefore reasonably expect to find in his book a very accurate drawing of the astrolabe as made and used in his day.

THE CROSS-STAFF 101

From a little work entitled 'The Seaman's Secrets,' a treatise on practical navigation, written by John Davis, of 'North-West Passage' fame, and the inventor of the 'double quadrant.' The first edition of the book appeared in 1594; the copy in the British Museum is dated 1607, 'newly corrected by the author John Davis of Sandrudge [*sic*] necre Dartmouth, in the countie of Devon. Gent.

COLUMBUS 105

From the portrait formerly in the Gallery of Paolo Giovio.

There are numerous portraits of Columbus, differing so widely that some are scarcely to be recognised when compared with others.

'Paolo Giovio, born at Coma in 1483' (and therefore contemporary with Columbus), 'had a good collection of portraits of illustrious men of his time. This, which is considered as representing with fidelity the features of Columbus, has a character remarkable for dignity and simplicity.'—Charton, 'Voyageurs Anciens et Modernes.'

VASCO DA GAMA 123

This portrait is taken from a Portuguese MS. in the British Museum (Sloan, 197) entitled 'Livro do Estado da India Oriental,' by Pedro Barretto de Rezende, and dated 1646. The MS. consists of three parts, the first containing forty-four portraits beautifully coloured, and descriptions of the early Portuguese Viceroys in India.

FERDINAND MAGELLAN 137

From a portrait formerly in the Versailles Gallery (No. 3091 of the Catalogue of Soulié) copied by C. P. Larivière from the original, which forms one of a series of historical portraits in the Château de Beauregard near Blois.

Speaking of this portrait, which was engraved for the first time for his 'Life of Magellan,' Dr. Guillemard says (p. 261): 'It represents a man of singularly refined and intelligent features and of no little personal beauty, which is rendered not less attractive from a certain shade of melancholy in the expression.'

THE

EVOLUTION OF GEOGRAPHY

CHAPTER I

ANCIENT GEOGRAPHY

In endeavouring to trace the evolution of man's ideas concerning the geography of the earth, we are met at the outset by the difficulty of reconstructing a story from records which do not exist. For it is clear that there must have been some notions of the earth, however vague, present to the minds of our primitive ancestors. But what were those notions? Emerging slowly into consciousness, struggling fiercely with his formidable enemies, and gradually conquering the forces around him, what were man's first glimmerings of a territory larger than his small cave and the country surrounding it? Were his ideas merely confined to a more or less accurate knowledge of the lands over which he wandered, or had he any perception of a larger land extending on all sides? What thoughts were born when he first beheld the wide expanse of sea, stretching out until it seemed to touch the sky?

To those primitive ideas we can assign no date.

When we consider that civilisation is of vast antiquity, without going back to the dim ages when man was merely a savage, we perceive the difficulty, nay, impossibility, of tracing to their real origin and epoch those primary conceptions.

Even when we examine some of the earliest records which have come down to us through the long ages, we find that the ideas are derived not from actual experience, but from sources so remote that we can but speculate as to their date and origin.

It is ages and ages after the dim epoch of primitive man that we have the first indication of an attempt to describe the earth or any portion of it.

The very earliest geographical references are without doubt those in the Bible, and they are older even than the references in the early literature of Greece, which is also very old.

In the Book of Joshua we have an example of what could be accomplished in the way of geographical description nearly 1,500 years B.C. It is a treatise of marvellous accuracy of statement. The portion dealing with the partition and settlement of Canaan after its conquest by Joshua has been called the 'Domesday Book of Palestine,' and it well deserves the name, for the surveyors who made the report were particular in their topography. 'Its notices, not only of distant regions, but of valleys, fountains, mountains, and villages, have been confirmed, often with surprising certainty and particularity.'[1] It is concerned, however, wholly with Palestine, and unfortunately contains no such reference as the well-known one in Ezekiel (ch. v., v. 5): 'Thus saith the Lord Jehovah: This is Jerusalem: I have placed her in the midst of the nations and of the countries round about her.' Now it is, perhaps, not strictly accurate to describe the Prophet's statement as 'geographical,' yet it was regarded as being accurate and unquestionably true, and it influenced men's ideas so largely that it is not only of vast interest, but of the utmost importance. It was quite correct so far as the Hebrews were concerned, having regard to the great nations surrounding them, such as Egypt, Babylonia, and Mesopotamia for example. But it was taken to be literally true, and applicable in a much wider sense, and when the earliest Christian world maps came to be drawn Jerusalem was represented as the centre of the picture.

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[1] See Smith and Fuller's *Dict. of the Bible*, vol. i. part ii.

As was natural enough, the Hebrews deemed the flat earth to be the centre of the universe. It was to them the most important part of their system. It is still the most important part of the universe to us. It was bounded on all sides by the ocean. 'The heaven was regarded as the roof of man's abode—the curtain of the tent stretched out for his protection. It was supposed to rest on the edges of the earth's circle, where it had its foundations and its massive pillars. It was the "firmament" for the support of the reservoirs of the rain which descended through its windows and doors. The sun, moon, and stars were fixed in this heaven, and had their respective offices assigned with an exclusive regard to the wants and convenience of the earth. Beneath the earth was *sheol*, "hell," which extended beneath the sea, and was thus supposed to be conterminous with the upper world. It had, in poetical language, its gates and bars, and was the abode of departed spirits.'[1]

But the Hebrews never 'expanded'—they never became great traders like the Phœnicians; and their 'earth knowledge' never extended beyond the Black Sea in the north; the lands bordering the Indian Ocean, and its great arms, the Red Sea and the Persian Gulf, on the south; whilst the Mesopotamian plains on the east, and the Grecian islands, the countries of the Levant, and Egypt as far as the Nubian desert, mark probably the western boundaries of their world.

The Phœnicians, on the contrary, did gain an extended knowledge of a considerable section of the earth. They became navigators, and attained a higher maritime power than any other nation of antiquity. Solomon's ships, a thousand years before the Christian era, were piloted by Phœnician sailors. At an early date they had extended their coasting voyages along the whole length of the Mediterranean, and had passed beyond the 'pillars of Hercules' into the waters of the Atlantic. Gades, on the site of the modern Cadiz, and Carthage had been founded by them 800 years at least before the birth of Christ.

The northern countries, too, were visited, and a trade established with the Cassiterides, or Tin Islands, for the metal from Cornish tin mines. In the opposite direction the Phœnicians acted as the carriers for the Egyptians, sending ships down the Red Sea and coasting the Arabian peninsula, into the Persian Gulf, and possibly even to the shores of India, and down the African coast as far as Zanzibar and Sofala.

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[1] Bevan, *Manual of Ancient Geography.*

What effect had all this activity upon other nations? Upon the Hebrews and the Egyptians, as we have seen, it had no effect whatever, from the point of view of geographical expansion. The Egyptians indeed are said to have drawn maps long before the earliest Greek map was made; but whatever knowledge they possessed, it does not appear to have been derived from actual travel. 'One work only has been discovered, which can be regarded as an Egyptian book of "Travels." It seems intended to give an account of a "Tour in Palestine," accomplished by a *mohar*, or engineer officer, in about the fourteenth century B.C.'[1] But there was another nation—the Greek—slowly rising into a civilisation which was to be without parallel in the history of mankind, where the enterprise of the Phœnicians was to bear fruit. Not that Greece in her early days emulated, or attempted to emulate, the long voyages of the Phœnicians, though she could equip a fleet and hold her own on the sea when the necessity arose. Greek philosophy used the data supplied by Phœnician travel, and evolved theories of the earth, some of which influenced men's ideas for centuries. But Greece affords us the opportunity for going back to times much earlier than the philosophers—to times of older notions, mythological fancies, and fables derived from hoar antiquity. The Homeric poems, as we know them, are records of the world-picture of remote ages, when man seized upon fancy to fill the blanks in his mental horizon. That the earth was flat was the general notion—flat and round, 'as round as the shield of Achilles'—and that encircling this flat earth there was the mighty river Ocean ever flowing.

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[1] Rawlinson, *History of Ancient Egypt*, vol. i., and see also art. 'The Notions of Classical Writers on Geography,' *Nature*, vol. lvii. pp. 482–3.

Without attempting to follow the wanderings of Ulysses, which afford little clue to Homer's knowledge of the earth, but indicate rather his want of it, the borders of Homer's world could not have extended much beyond Greece and the Islands, and possibly to Sicily and the neighbouring coast of Italy, whilst all beyond was vague. Homer and his Greek contemporaries knew very little of the earth beyond Egypt—as far as the Libyan desert—and the coasts of Asia Minor. Rumours of races of black Ethiopians seem to have been carried to Greece in these early times, since Homer speaks of them, as well as of the Pygmies; but we have nothing to indicate that any Greek has as yet become a traveller and visited the countries of the blacks. It is not until the time of the poet Hesiod (about 750 B.C.) that we get our first notice of the Nile as a great river of that name, though the importance of the Nile to Egypt seems to have been known to Homer, who regarded the country as Egyptus, the 'gift of the Nile.'

But though Hesiod shows us some definite geographical knowledge—if the mention of the Nile, the Ister (Danube), and a few other rivers is to be regarded as such—he also introduces myths which recur again and again under different guises through the writings of succeeding authors. The hyperboreans dwelling 'beyond the north wind,' the griffins, the dog-headed men are to be ascribed to Hesiod, based possibly upon some slender foundation of fact derived from confused reports, like the story of a race of dwarfs, which was clearly a reference to the Pygmies, whose descendants still inhabit the fastnesses of Central Africa.

The remarkable extension of Greece was beginning to be felt in the days of Hesiod. The colonising impulse had sent emigrants to Sicily as early as the eighth century B.C. Naxos and Syracuse were founded shortly afterwards, and, more important as an indication of advancing knowledge of the earth, the colony of Massilia, on the southern coast of Gaul, was planted about the year 600 B.C. In the other direction settlements had been made on the shores of the Bosporus and the Euxine (Black Sea), the most important on the Euxine being Sinope and Trapesus, which soon rose to be trading centres of importance ; the latter continues to be so to-day under the modern name of Trebizond.

Owing to all this colonial expansion and consequent intercourse, geographical knowledge was rapidly extending. According to Plutarch, Thales of Miletus, in the sixth century B.C., taught that the earth was spherical, though the credit of this doctrine belongs rather to Pythagoras. It was in astronomy and geometry that Thales earned his great reputation—he is said to have discovered the causes of eclipses, and also to have foretold a celebrated eclipse of the sun that occurred on May 28, 585 B.C. We are on sure ground, however, when we deal with Thales's disciple Anaximander, who first introduced maps, and is therefore for ever associated with one of the most important events in the history of early geography.

of three continents—Europe (which had hitherto been regarded as the northern part of Greece), Asia, and Libya—and such important towns as Susa, Babylon, Ecbatana, Tyre, Memphis, and Canopus, and the cataracts of the Nile; and from Pindar, who refers to Cyrene in Africa, and Gadeira in Spain.

B.C. 480

Herodotus is our next great figure, and he certainly carries us a long way on our road, since by reason of his work in actual land travel, collecting information for his great history, he speaks with authority, and illustrates one of the most interesting travels of those early days.

His ideas of the earth were not in accordance with those of his contemporaries; he rejects the circular flat earth theory, but instead of supplying us with another theory in its place, he proceeds to describe Asia and Europe.

For our purpose it will be sufficient to mark the boundaries of his knowledge of the earth, and those boundaries may be fixed at the Danube and the countries of Southern Russia (Scythia) in the north, India in the east, Abyssinia in the south, and the Pillars of Hercules in the west. But it is not saying too much to state that he knew *something* of all the vast territories within these limits.

We shall see how much geographical knowledge a keenly observant writer like Herodotus must have gleaned if we follow the course of his travels.

Starting from Halicarnassus in the year 464 B.C., he probably first sailed to Egypt, visiting Memphis, Heliopolis, and Thebes, storing his mind with ideas derived from talks with priests of the temples, and noting the manners and customs of the people.

From Egypt he struck into Libya, inquiring as to the number of its inhabitants as a small part of his occupation, little knowing the extent of the continent he was treading! Back through Egypt to Syria, to the towns of Tyre and Tarsus, and incidentally writing or making notes for a history of Phœnicia, Syria, and Palestine. Then southwards into Arabia, the 'Ethiopia of Asia,' as he calls it, and after exploring Babylonia directing his steps to Persia, where he traversed the plains and visited the battle-fields where the Persians had opposed his countrymen. Extending his journey to the Punjab district he turned to the country of the Medes, and speaks of the great city of Ecbatana, with its 'seven concentric walls,' which the Medes had founded.

Thence turning homewards past the Caspian and Black Seas, through Scythia and Thrace into Greece, he completed his work by going to the battlefields. The Pass of Thermopylæ, the plain of Marathon, the field of Platæa, were all objects of his attention. He must have felt the charm of

'. . . footing slow across a silent plain,
Where patriot battle had been fought, where glory had the gain.'[1]

This and the applause he received when he read his books to the people were no doubt ample recompense for all his trouble.

Among the many incidents with which he makes us acquainted is the curious one of the voyage by certain Phœnicians, under the direction of Necho, king of Egypt, who sent them down the Red Sea with orders to continue along the coast. They sailed on until their stock of provisions wanted replenishing, when they landed on that part of Libya whither their voyage had taken them. Here they sowed corn, and waited until it was fit to reap; when they continued their voyage, keeping on round the African continent until they turned the Pillars of Hercules, and sailed along the familiar waters of the Mediterranean, reaching Egypt in the third year after they had set out.

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[1] Keats.

The story is one that has given rise to much discussion, and many arguments have been advanced both for and against. The statement that the navigators had the 'sun on their right hand' in sailing down the African coast has been a very strong argument in favour of the voyage having been accomplished, as well as the circumstance that the voyage was commenced from the Red Sea, by which the Phœnicians had the advantage of the northern monsoon to carry them well into the tropics, and then the aid of Rennell's current in coasting along the south-east part of Africa.

But whether the Cape of Good Hope was really doubled some 2,000 years before the time of Vasco da Gama is one of those secrets of the past which we may never hope to fathom. It nevertheless remains of extreme interest to us.

There is another long voyage, more authentic than the circumnavigation of Africa by Necho's ships—namely, the colonising voyage of Hanno the Carthaginian, which, though somewhat earlier than the time of Herodotus, falls conveniently within this period.

It was a well-organised expedition, consisting of sixty vessels suitably equipped and carrying an enormous number of men and women. The fleet sailed from Carthage along the Mediterranean, through the Straits of Gibraltar, and then turned southwards along the African coast. Numbers of colonists were disembarked at suitable points, and the foundations of more than one town were laid. Hanno continued the voyage as far south as the modern Sierra Leone, until want of provisions compelled him to put back. Among the trophies brought back to Carthage were the skins of two huge apes that had been killed on the coast.

Another voyage from Carthage, which may or may not be genuine, was the voyage of Himilco, who was sent out by the Carthaginians to explore the Atlantic coasts of Europe. He is said to have been successful in reaching Albion and Ierne (Ireland), but was prevented from sailing beyond owing to the sluggishness of the sea, the masses of seaweed, and the want of air, which combined to check his progress.

A long journey of quite another kind was the one recorded by Xenophon in the 'Anabasis,' the march of Cyrus the Younger in command of the Ten Thousand through Asia Minor. The retreat of the Greeks after the battle of Cunaxa, where Cyrus was killed, was northwards through the Assyrian plains and the unknown mountain passes and highlands of Armenia to Trapezus; and although even to-day so meagre is our knowledge of the country that we cannot with certainty trace the actual route, yet in Xenophon's day the expedition must have served to extend Greek ideas, although the increased knowledge was confined to a comparatively small section of Asia.[1]

We can say more than this, however, of the great military operations of Alexander the Great, for they extended over a much larger area ; but the real importance of these long expeditions was the effect they had on opening up the road into the very heart of Asia. From Macedonia to the foot of the Hindu Kush was not inconsiderable, yet Alexander laid open a more extended tract than this, for he crossed the range (B.C. 327) and led his army southwards into India, and constructing a fleet of boats on the Indus, descended that river to its mouth. Arrived there he gave the command of the vessels to one of his officers, Nearchus, with directions to continue the voyage along the shores of the Erythræan Sea and the Persian Gulf. It could, naturally, be no other than a coasting voyage, and a hazardous undertaking at the best, for the waters of the Indian Ocean were as yet quite unknown to Greeks, and they had no means of making a voyage away from sight of land. At different points the ships were brought to anchor, whilst the soldiers landed in search of water and provisions. Past the wild shores of Beluchistan, with their fish-eating tribes as uncivilised then as they are to-day, the fleet sailed, and then into the Persian Gulf, encountering *en route* a school of whales, to the great alarm of the men. After a voyage of some five months

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[1] See, however, Tozer's *History of Ancient Geography*, pp. 112–118, where the route is traced.

Nearchus brought his vessels in safety to the mouths of the Tigris at the head of the Persian Gulf, having successfully accomplished one of the earliest voyages of discovery.

A work of geographical value known as the Periplus of Scylax falls within this period. It consists of a description, or rather catalogue, of the towns of the coasts, headlands, mouths of rivers, and so on, beginning at the Pillars of Hercules, following the northern shores of the Mediterranean as far as the Black Sea, thence along the coast of Asia Minor and Africa, with a brief reference to the Carthaginian settlements beyond the Pillars of Hercules on the African coast bordering the Atlantic. It was in reality a workaday guide, the earliest known 'Pilot' for any one making a coasting voyage, and doubtless was drawn up to serve no other purpose.

B.C. 340 Another long journey, of extreme interest to us, since it brings an early traveller to our own shores, was accomplished during the Alexandrian period by Pytheas of Massilia. Beginning the voyage from Massilia with one vessel, Pytheas sailed through the Straits of Gibraltar, and turning northwards coasted the Iberian peninsula and Gaul, came into the English Channel and beheld the white cliffs of Britain. He explored the coasts of Britain, though it is uncertain how far he actually took his vessel; but besides carrying back to his countrymen the first authentic and trustworthy account of Britain, he was the first to mention the existence of a more northerly island which he called 'Thule,' six days' voyage to the north of Britain, where the sea became so thick that navigation was impossible

Retracing his course to the continent, he explored the coast as far probably as the mouth of the Elbe.

Pytheas is also said to have had some astronomical knowledge, a statement which appears to be well founded, since his calculations of the latitude of Massilia were adopted as correct by his successor Hipparchus and were, in fact, very near the truth.

The phenomenon of the tides also came under the observation of Pytheas, and he held the theory that the tides were to be attributed to the lunar influence. It was a phenomenon that had puzzled his predecessors, and various extravagant notions had been advanced to account for it. One was that the ebb and flow of the waters was caused by the breathing of a huge marine animal.

Such work as had already been accomplished, imperfect though it undoubtedly was, bore fruit under the Ptolemies of Egypt in the third century B.C. The accumulated knowledge which the Greeks had acquired from so many sources was absorbed and focussed by Eratosthenes.

About the year 240 B.C. he had been placed in charge of the great library established by the Ptolemies at Alexandria—the magnificent library which is said to have contained upwards of 700,000 volumes, and which disappeared with all its priceless treasures in the sack of the city by the Khalif Omar in 640 A.D.[1]

With the wealth of this library at his command,

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[1] The story of the wanton burning of the contents of the library by the Saracens under Omar's captain is now discredited. The library sustained great damage during the siege of Alexandria by Julius Cæsar.

Eratosthenes wrote three books on geography, and, bringing mathematics to his aid, laid the first foundation of a really scientific geography.

And first with regard to the form of the earth, Eratosthenes, like his illustrious predecessor Euclid, held it to be spherical and to occupy the centre of the universe, a belief which appears to have become fairly general by this time, at least among scholars. By means of the gnomon he measured the size of the earth, and so careful was his measurement that it gave the circumference of the earth with a very narrow margin of error. He estimated the size at about 28,000 miles, whereas the exact equatorial circumference is 24,900 miles. Eratosthenes also attempted to estimate the distance of the sun and moon from the earth, but naturally with the instruments he possessed the results were poor.

Although a scientific writer like Eratosthenes could make a calculation of the size of the globe with so small a margin of error, he held, in common with his contemporaries, that the work of the geographer was to deal with the habitable world as he knew it, and that the (assumed) uninhabited portion was outside the scope of his labours. It followed, therefore, that the world as depicted and described by Eratosthenes, instead of including the world as he had measured it, was confined to narrow limits bounded on the north near the parallel of Thule by the cold uninhabited regions, and terminated on the south by the parallel passing just south of the limits of the Red Sea, the Cinnamon regions, as the countries were called in the neighbourhood of Cape

Guardafui, beyond which the land was unpeopled on account of the torrid heat. The western limits were defined by the shores of the Iberian peninsula washed by the Atlantic, and ended abruptly in the east by a distorted notion of the countries in the neighbourhood of India.

Holding the globular theory of the earth, Eratosthenes defined an equator to his globe and then proceeded to draw eight parallels to it, one of which he traced from the Sacred Promontory (Cape St. Vincent), passing through the Straits of Gibraltar, the Straits of Messina between Italy and Sicily, and so on through the southernmost points of Greece to the Bay of Issus on the extreme north-eastern end of the Mediterranean, an arrangement which we see is clearly wrong, since these places do not lie on the same parallel. The next step was to describe meridians at right angles to the parallels, and Eratosthenes, considering that Rhodes and Alexandria were both on the same meridian (an error of more than a degree and a half), constructed his first meridian passing through these two places. Six other meridians were drawn by him, but they were not at uniform distances; he preferred rather to carry them through important points or towns such as the Pillars of Hercules, Carthage, Alexandria, the mouth of the Indus, and so on.

It will be valuable, before we proceed further, to glance at the more important errors into which Eratosthenes was led, either by his adopting misleading reports of sailors and travellers, or by his own imagination. Besides the fundamental error of compressing his world into very narrow limits, the Caspian Sea is connected by a channel with the Northern Ocean; the Ister (Danube) sends a branch into the Adriatic; the Bay of Biscay is omitted; whilst the British Isles are greatly drawn out and lie in a wrong direction. The African continent trends rapidly away from its western point south-eastwards to Cape Guardafui; the south-eastern portion of the Arabian peninsula is prolonged eastwards and exaggerated; the Ganges flows into the Eastern Ocean; and Ceylon, which Eratosthenes called Taprobana, is a huge island stretching east and west; whilst across the whole of Asia, so far as it extends, a mountain range runs in one unbroken line.

Yet, lest we may be tempted to undervalue the work of Eratosthenes, we should remember that his work, as Sir Edward Bunbury points out, 'is not only much nearer the truth than that adopted by Ptolemy three centuries later, but it is actually a better approximation than was arrived at by modern geographers till about two centuries ago.'[1] The aim of Eratosthenes appears to have been to lay down a correct working basis for all subsequent writers to work on, and in this he succeeded. No great improvements or additions to his map of the world were forthcoming until the middle of the second century of the Christian era.

B.C. 150 Hipparchus, 'the lover of truth and labour,' about 150 B.C., modified the map of Eratosthenes, and checked the distances, basing his calculations on data derived from observations of eclipses; but there is no geographical writer of any value until we come to Strabo.

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[1] *History of Ancient Geography*, vol. i. p. 635.

Hipparchus, however, improved upon Eratosthenes by drawing the meridians at equal distances from the prime meridian, instead of at irregular intervals as his predecessor had done. He also divided the known or habitable world (the terms to him were interchangeable as we have seen) into climates or zones of latitude, an arrangement which many geographers followed in after centuries.

B.C. 60 to A.D. 19

Strabo, our next great figure, gathered his materials from the writings of all the earlier geographers, some of whom he assailed for errors into which he himself fell; but, before we deal with the comprehensive work of Strabo, it will be necessary to review briefly the causes which led to so large an increase in geographical knowledge that Strabo himself declared it was this increased knowledge that induced him to go again over ground already covered by his predecessor Eratosthenes: those causes may be summed up in the words—Roman Empire.

It is supposed that Strabo did not complete his work until A.D. 19, and he therefore knew Rome as the mistress of a mighty empire extending her sway over the vast dominions of the Augustan age.

The Roman Empire at that time, radiating in all directions from Rome as its focus, comprised all the important nations bordering on the Mediterranean from Egypt to Numidia, whilst northwards her boundaries were marked by the Rhine and the Danube. Eastwards she extended almost as far as the Caspian Sea, and in the west the whole of the countries from Spain to the English Channel acknowledged her rule. Many of the more hardy tribes were still able to bid defiance to their powerful neighbour and keep the Roman soldiers out of large tracts within these limits, as for instance the German tribes who annihilated Varus and his four legions in A.D. 9, but in a general sense Rome was already mistress of the whole of this vast territory.

Strabo himself had seen the victorious Augustus at Corinth on his way to Rome after the battle of Actium (B.C. 31), where Antony and Cleopatra had suffered defeat, and the triumphal march of the ruler of the whole Roman world must have impressed the geographer with an idea of large territories; but more than this, Strabo had travelled over a great part of the empire, 'from Armenia to Tyrrhenia (Western Italy) and from the Euxine to Egypt and up the Nile as far as Syene and Philæ,' as he boasted. Whatever the value of his travels may have been to him, he took a much wider view of geographical work than his predecessors, and his books contain detailed descriptions of countries, with their natural productions, physical peculiarities, and so forth. Strabo wrote in a general sense, and did not hesitate to digress into long historical and mythological arguments, but this was all a part of his plan to deal thoroughly with his subject.

But it was in the western and north-western parts of Europe that the great increase in men's knowledge had taken place. We have already seen what Alexander's marches had done for Greece, by opening up a knowledge of Asia, to a considerable distance beyond Cabul in one direction westwards, and as far as the Arabian littoral in the south. Roman conquests had turned in the opposite direction.

Julius Cæsar, by his energetic operations, had subdued Gaul by the year 50 B.C., and the Britons and many of the tribes in the Rhine countries had felt the force of his arms. He had penetrated with his legions to countries where no Roman army had ever been before. But in addition to his military genius, Cæsar could write of the countries he conquered ; and his descriptions of Gaul and Britain, 'the distinct and clear statements of an able observer and remarkably lucid writer,' are valuable additions to geographical knowledge.

It seems strange that the Romans should have been singularly deficient in great geographical writers. Cæsar is almost the one remarkable exception ; Strabo was of Greek parentage, having been born at Amasia in the Greek province of Pontus, on the south of the Euxine.

A further indication of enhanced facilities for the work of the geographer is afforded by the administrative system introduced by the Romans into all their provinces; and the construction of roads, which formed a part of that system. The roads, as we know, were marked by milestones, and itineraries were drawn up recording the distances from point to point.

Agrippa, who had constructed not less than four great roads in Gaul during his governorship, also prepared a map of the world and had it set up in Rome, for public inspection, in order that the young Romans might see the wealth of their inheritance. The itineraries, as we shall see, survived for some centuries as valuable pocket companions to the traveller, and in the early centuries of the Christian era we shall find them imitated and turned into illustrated guides, which served all the purposes of a modern 'Baedeker' or 'Murray.'

Yet with all this help we do not find that Strabo carries us much farther than Eratosthenes—indeed in some respects he is even inferior to his predecessor. But his ideas were scientific. He conceived the earth to be spherical, though he believed it to occupy the centre of the universe. The habitable part of the earth he placed within the northern hemisphere, and still regarded the northerly regions as uninhabited on account of the cold, and the south as also unoccupied by reason of the scorching heat. It was an idea which men held for centuries, and the danger of penetrating into these 'torrid' regions was advanced even in the thirteenth century, when the Portuguese began to coast Africa.

Strabo conceived, and rightly too, that as the inhabited portion of the earth (as he believed) occupied no more than about a third of its surface, there might exist other countries of which nothing was known. But he consoles himself with the reflection that if any such do exist they would be inhabited by different races of men, and therefore need not concern the geographers. The form of this inhabited portion was deemed by Strabo to be analogous to a mantle or cloak; the northern regions, being contracted, represented the upper part of the mantle. The idea, as we shall see, was handed on to Ptolemy, who adopted it with little modification and gave the world the shape it has in his famous map. Strabo also noticed the difficulty (which must have occurred to some, at least, of his predecessors) of correctly representing a curved surface on a plane; and he perceived that a 'projection' must be to some extent erroneous. But it took centuries to work out scientific projection, and it was not until the time of Mercator in 1569 that globular projection came anywhere near to perfection.

The various countries described by Strabo are subject to some strange distortion. For the most part he follows Eratosthenes, correcting and altering where he considers it necessary. Britain, according to Strabo, was triangular in shape, its base extending opposite the shores of Gaul from the mouth of the Rhine to the Pyrenees. Strabo, we see, had a most liberal notion of Britain; but he rejected the idea of a 'Sister Isle,' and accordingly placed Ierne (Ireland) many miles to the north of Britain. His error with regard to the size of Britain was not so glaring as may appear. It was in contracting to such an extent the whole of the western parts of Europe that his great error lay. Gaul was squeezed up into narrow quarters between the Rhine on one side flowing northwards a short course from the Alps, and on the other side by the Pyrenees lying parallel to the Rhine.

Strabo also rejected the Island of Thule as entirely chimerical, and omitted it altogether, so that Ireland was the most northerly land of which he knew, or the existence of which he credited. Still, notwithstanding his defects, Strabo remains one of the greatest names in ancient geography. He realises the importance of the subject with which he deals, and approaches it with this impression upon him. 'They who first ventured to handle the matter were distinguished men,' he tells us at the very outset: 'Homer, Anaximander the Milesian, and Hecatæus, Democritus, Eudoxus, Dicæarchus, Ephorus, with many others, and after these Eratosthenes, Polybius, and Posidonius, all of them philosophers.' And, imbued with the philosophical nature of his undertaking, he deals with it accordingly. As a French writer has said, 'Strabo's books might be called the "Philosophy of Geography."'[1]

It will be seen that Strabo does not cite Herodotus as one of his 'distinguished men,' and it seems strange that he should pay such scant attention to, and hold so poor an opinion of, the mass of information collected by the Father of History; but his admiration for Homer was profound. To Strabo the wanderings of Ulysses were not only geographically possible, but were matters of fact which no sensible Greek could doubt. Strabo, indeed, is the Grand Old Man of Geography.

A.D. 23 to 79

Some fifty years elapse between the death of Strabo and the appearance of Pliny, the 'Naturalist,' with his long array of books dealing with everything under the sun—a truly encyclopædic undertaking, 'an astounding monument of industry,' as it has been well termed.

By the time of Pliny the Empire of Rome had extended by conquest and absorption to still further limits than in the days of Strabo. The African province of Mauretania had come within Roman boundaries, completing her sway along the whole of the northern countries of Africa; and Britain was subdued from Kent to the borders of Wales and as far north as the Cheviots.

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[1] See Tozer, *Selections from Strabo*, p. 33.

But the natural boundaries of the Empire formed by the Danube and the Rhine still continued to mark the limits of Roman influence in these directions. The policy of Augustus had been to keep the Empire within these limits, and the construction of roads in direct communication with Rome and the frontiers was part of this policy. Geographical knowledge had consequently become more exact.

We see this in the treatise of Pomponius Mela, who, **A D. 40** while he does not carry us actually beyond the limits of his predecessors, introduces more accurate details, and rectifies many serious defects. The size and figure of Gaul, for example, are established, and the Pyrenees are more carefully described. The earth is divided by him into five zones, and he assumes that in the south there exists a temperate zone corresponding to the northern one with which all were familiar; and, what is more remarkable, he assumes the southern temperate zone to be inhabited, although inaccessible from the north on account of the fierce heat of the torrid zone. According to Mela, Taprobane (Ceylon) was the beginning of this great unknown continent in the southern hemisphere. An original and bold speculation. Pliny, on the other hand, had no new theories of his own to advance. He was the industrious collector of facts from every conceivable source, the omnivorous reader devouring every work to which he could gain access. He avowed that he had read more than 2,000 books; but he suffers from repletion, and, therefore, while he is comprehensive, he is yet wanting in the qualities that made Strabo so great a geographer. His encyclopædic work is nevertheless valuable; it is, as Humboldt said,[1] 'the greatest Roman memorial transmitted to the literature of the Middle Ages—composed in a true spirit of cosmical description,' and is remarkable as the first attempt, as Pliny himself declares, to treat of the *whole* of nature. An advance clearly upon the work of his predecessors, and the cause of which is to be sought for apart from any influence derived from them; for whilst Pliny gives a long list of various authors from whom he had compiled, he never once mentions Strabo, the most comprehensive of them all. We cannot doubt that the potent force contributing to produce a writer like Pliny was the influence of the Roman Empire, which tended more and more to centre in one man from the time of Augustus onward. It is the 'grand unity of nature,' as Humboldt calls it, that distinguishes the conception of Pliny; and his geography, though defective, is part of this idea.

His notices of the distant countries of Asia are fuller, and indicate an increasing trade between Europe and the East. Silk he mentions as being produced by the Seres, inhabiting a district beyond India, and he describes the route from India to the Caspian by which the Greek merchants received their goods. Palmyra, still independent and carrying on an extensive trade, is also first mentioned by Pliny. His knowledge of Africa was but hazy, although better than that of any previous writer; the Niger receives its first notice, and he also mentions the march of Suetonius (who defeated Boadicea in Britain) into Mauretania and across the Atlas Mountains.

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[1] *Cosmos*, vol. ii. 1849.

It was the great array of materials gathered together by Pliny that gave him so much prestige. He became at once an authority both for his facts and for his many fables which were regarded as facts, and his works continued to retain their importance even in the Middle Ages.

Commerce, the handmaiden of many arts and sciences, continued to flourish and extend during this period, with important geographical results, as we shall see. Whether we regard Rome or Alexandria as our focus is immaterial. Both were great trade centres, and both were in touch with the most distant parts of the Empire. From remote Britain on one side, hides, corn, slaves, hunting dogs, pearls which the Roman ladies did not despise, and oysters that pleased the palates of their husbands, were brought to Rome. Silk, precious stones, gold, and spices found their way from the Far East to Alexandria and thence to Italy. The northern ports of Africa were regularly visited by Roman vessels for a supply of elephants, lions, panthers, ostriches, and other wild animals for the Roman amphitheatre.

One result of all this trading activity, and the constant passage of vessels from port to port, was to create a demand among merchants and mariners for 'sailing directions' drawn up much on the same lines as the old periplus of Scylax. Pliny had made use of some of these, and shortly after his time a celebrated one appeared, known as the Periplus of the Erythræan

Sea, an anonymous work, but doubtless 'written by a merchant for the use of merchants'—written at any rate by one who was familiar with all the shores of the Erythræan Sea—river-mouths, ports, distances, and such details as a merchant would most value; not merely the bare mention of places with their distances one from another, but a useful guide to the exports and imports of the different countries. A valuable aid to commercial relations with India had been rendered in Pliny's time by a navigator named Hippalus, who made a study of the winds of the Indian Ocean and discovered the periodic nature of the monsoons. The reliability of the south-west monsoon was so firmly established that trading ships were taken in a direct course from Africa or Arabia to the Indian ports instead of by the old coasting route. And the return was timed to coincide with the change in the monsoon, and the consequent benefit of a north-east wind to carry the vessels back.

The details of the Periplus are interesting even from the knowledge they afford us of an early trade route, a route along which a great stream of commerce again flows since the construction of the Suez Canal.

By help of the Periplus we may follow the passage of merchants and traders from Alexandria up the Nile as far as Syene, and then overland to Berenice on the Red Sea, where the vessels took in their cargoes and sailed down to Aden, already in those days a sort of halfway house and a place of commercial importance, and from thence either to the ports down the African coast as far as Zanzibar, or to Arabian and Indian trading places.

The more distant countries of Asia also receive some indefinite notice by the author of the Periplus, though it seems clear that traders from Egypt did not penetrate so far as Ceylon. Such information as they possessed of the more remote regions was doubtless derived from hearsay.

A.D 150

The greatest figure of this period, and the name that marks the highest pitch of perfection in early geography, is Ptolemy (Claudius Ptolemæus). In many essential respects like the older writers who dealt with the subject, he is yet unlike them all in the completeness with which he lays before us a system of the world.

He combines the characteristics of many of his famous predecessors. Like Hipparchus he was an astronomer; he set himself the task of reforming the map of the world in much the same way as Eratosthenes had done; and he collects information from many sources like Strabo and Pliny, though with more discretion than the latter, who had not always relied on the recent writers of his time, but had gone back to older and less trustworthy sources.

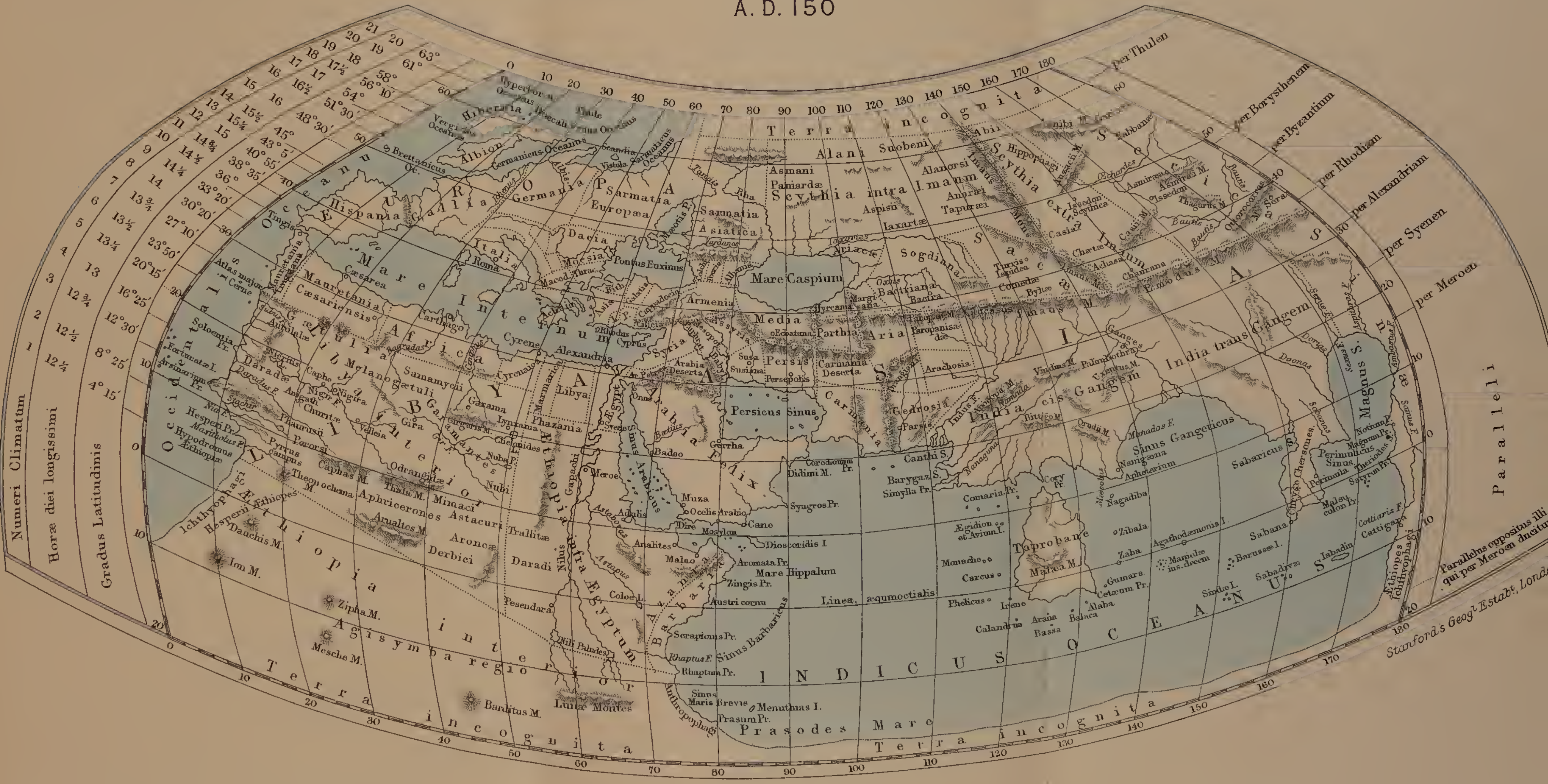
By the time of Ptolemy a further extension of empire had taken place, and the increased commercial intercourse had resulted in much valuable detail supplied by merchants in the form of itineraries. From these Ptolemy derived a great deal of the fuller information he possessed, though they had the effect of leading him into errors. In point of fact the further extension of empire counts for very little. The boundaries of the Roman world had not extended so as to produce a much better acquaintance with new countries or the peoples inhabiting them. But Roman traders were travelling far and wide, and adding considerably to the sum of geographical knowledge; and a large number of writers had taken up the subject, contributing treatises on all branches of the science.

Clearly the geographical idea had made great strides and was extending; but though the mass of materials ready to the hand of a writer like Ptolemy enabled him to complete a theoretical system, his data were too inaccurate to give definite results.

As was natural to an astronomer, Ptolemy perceived that the only scientific basis on which a map could be constructed must be founded on astronomical observations, and as but few of the latter had been made in his time, he was thrown back upon itineraries and peripli, with the result that he perpetrated the errors of his predecessors. But the peculiarity of his system, the feature that gave him such wide celebrity, was that upon erroneous and exaggerated reports he drew up tables of places with definite latitude and longitude (apparently) assigned to them. Ferro in the Fortunate Islands (the Canaries) was chosen from which to calculate his longitudes, the parallel of Rhodes was his chief line of latitude, and yet both were incorrectly placed to start with. But the author of the Almagest, as his great astronomical work was designated by the Arabs, earned a reputation in geography which centuries did not shake. It was not till the time of Copernicus in the sixteenth century, that the Ptolemaic system in astronomy was upset, and his geographical system likewise held the field until the great discoveries of the Middle Ages shattered that also,

THE WORLD ACCORDING TO PTOLEMY

A.D. 150



London Edward Stanford, 26 & 27, Cockspur St. Charing Cross, S.W.

though the mathematical foundations of his system remain ‘for ever the basis of trigonometry.’

But in truth Ptolemy’s work indicates the high-water mark of a tide that was soon to ebb, even if it had not already begun to recede.

We are hastening on to a period conspicuous for its dearth of intellectual achievement. The accumulated treasures of Greece and Rome were to pass into the hands of aliens and barbarians. The Arabs ultimately became possessors of European knowledge as well as of a rich part of European soil, and when they extended their sway along Northern Africa and thence into the Spanish peninsula, western Europe gathered up, centuries afterwards, the fragments that remained of the old-time culture.

We need not follow all the copious details of Ptolemy’s geography. There are, however, some peculiarities introduced by him into his map which we may notice. In general shape his countries are narrowed at the north, and enormously extended as they approach the south, so that the eastern parts of Asia are carried a long way beyond their true distance from Europe and Africa. By a startling theory he extended Eastern Asia southwards until it terminated in a vast undefined continent, the ‘terra incognita,’ connecting with a similar extension of Africa to the south-east, thus making the Indian Ocean a vast land-locked sea.

The sources of the Nile were located in the famous Mountains of the Moon, ‘the snows from which are received by the lakes of the Nile,’ Ptolemy apparently accepting the story told to Herodotus by the Registrar of Minerva's treasury at Sais, in Egypt, though Herodotus himself had doubted its genuineness.

The account given by the Registrar—the only man who professed to be able to enlighten Herodotus on the point—was that the sources of the Nile were to be found in bottomless springs rising midway between two mountains named Crophi and Mophi. Needless to say, the 'mountains,' under the ægis of Ptolemy, grew in size and importance, and figured conspicuously on maps of Africa down to the present century. Keats, in 1818, addresses the Nile as

> 'Son of the old Moon Mountains African,
> Stream of the Pyramid and crocodile.'

As time went on, the Mountains of the Moon underwent strange vicissitudes at the hands of geographers, being moved about to suit each succeeding discovery, and sometimes extending as a great range from Abyssinia to the Gulf of Guinea. It is only within our own times that Casiti and Sir Henry Stanley have brought to light the fact that snow-capped mountains actually exist to the north of the Albert Edward Nyanza, Ruwenzori, 'the Snow King,'[1] and others, nearly on the Equator.

The valuable legacy of Ptolemy was, however, his error in regard to the distance between western Europe and the eastern coasts of Asia. The distance was diminished by him no less than 50° of longitude, and it contributed centuries afterwards to the discovery of the

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[1] 'Rain-Maker' and 'Cloud King' are among the many names by which it is known to the natives. The correctness of identifying the Ruwenzori highlands with the 'Mountains of the Moon' has been questioned. See *Africa*, vol. ii. p. 565 of *Stanford's Compendium*, by A. H. Keane.

New World. Columbus cited Ptolemy as one of his most potent authorities when estimating the distance to be sailed from Europe to the Indies.

Occasionally during this period we find the record of a traveller still collecting information for 'guide-books' and peripli. Pausanias is a type of this worker; he travelled through Greece and the neighbourhood, improving on the information already known to travellers, adding details of the roads and the towns through which he passed. The system was adopted by the earliest pilgrim writer in the fourth century. **A.D. 175**

CHAPTER II

EARLY CHRISTIAN AGES

THE period we are entering is one that ushered in the 'Dark Ages;' and geography as a study and a science, like all other arts and sciences, was subject to the same depressing influences—a period when the accumulated treasures of Greek art and Roman thought and energy were spent and dissipated. A great lethargy came over intellectual life; 'the unity of power and civilisation was at an end; the intercourse of commerce was broken up and suspended; the light of letters became gradually extinct, and darkness once more overspread the western world.'[1]

In the decline of the grandeur of the Roman Empire and the chaos of western Europe we find the Christian spirit slowly giving rise to new ideas. No longer do we follow a conqueror like Cæsar into new lands and enlarge our view of the inhabited world, but instead we have the pilgrim habit developing, leading travellers to Rome and to the Holy Land from all parts of Europe, adding nothing to the sum of men's geographical knowledge.

Yet the link is important. The restlessness of the northern tribes, untouched by either Christian or

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[1] Cooley, *Hist. of Maritime and Inland Discovery*, vol. i.

Moslem, led the Northmen to continue in their own fashion the expansion typified by the military civilisation of Cæsar.

The strong spirit of the North lent its aid to Christian Europe when the crusading times came as a natural consequence of the pilgrim movements. And the impetus acquired by the western nations from all the crusading unrest had its ultimate effect in the European expansion of the later Middle Ages, and the subsequent foundation of the New Europe beyond the Atlantic.

It will be altogether beyond the scope of the present sketch to trace the whole of the history of these early pilgrim journeys. The pilgrimage of Helena, the mother of Constantine, seems to have given a dignity to the habit which was soon apparent in the better class of persons who visited Jerusalem from the west in the spirit of religious devotees. She travelled to Jerusalem in the year 326 when in her eightieth year, and caused two churches to be built there, 'one at the Cave of the Nativity, the other on the Mount of the Ascension;' and the finding of the true cross, which was by some ascribed to Helena, also tended to draw more pilgrims to the spot, since the story is said to have been reported throughout the Christian world.[1]

The earliest Christian guide-book of which we have **A.D. 333** any knowledge was one compiled, on much the same lines as the 'guide' of Pausanias, by an anonymous writer known as the 'Bordeaux Pilgrim.' His 'Itinerary from Bordeaux to Jerusalem '' was written about the year 333.

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[1] See art. 'Holy Places' in Smith and Cheetham's *Dictionary of Christian Antiquities.*

The writer of the 'Itinerary' has no intention of giving us a geographical treatise; his value in this respect is accidental. He has eyes but for the 'holy places,' and he ignores everything on his road which might detract from his pious intentions. The route laid down is clear, and it was the one followed for many years by all pilgrims coming from the countries he traversed.

Let us take our iron-shod staff and accompany the pilgrim on his long journey. Besides the staff, though, we must have a cloak or mantle of coarse black serge, a 'sclavine,' as it was afterwards called, a broad-brimmed hat to keep off rain and sun, good stout sandals to protect our feet, a leathern wallet or scrip, and a water-bottle. Thus equipped we set out from Bordeaux, taking the main road through Arles and other towns of Southern Gaul, towards the Alps, which we cross, marvelling the while at the mighty giants that lift their snow-capped heads above us, and trembling as we hear the roar of some distant avalanche. This part of our journey, however, we accomplish in safety, and soon are descending into the bright plains of sunny Italy. Turin, Pavia, Milan, Brescia, Verona, Aquileia at the head of the Adriatic, and so on—our guide knows them all—and we push on to the Julian Alps, possibly with some other pilgrims for companions. Now we strike into Noricum, Pannonia, Illyria, Dacia, Thrace, whilst every day we are becoming more bronzed and hardy. At Constantinople we cross the Bosporus into Asia Minor by the great military road to Syria.

Arrived in the Holy Land our guide slackens the pace, and we make many stoppages to visit holy places and offer up prayers. Tarsus, the birthplace of St. Paul, Mount Carmel, the bath of Cornelius at Cæsarea, Mount Sinai, Stradela, where Ahab sat and Elijah prophesied, the scene of David's victory over Goliath are all the objects of our devout attention. We reach Jerusalem at last, and our pilgrimage is so far successful. We visit many other famous spots, and return to Constantinople by a different route, going from thence through Greece and subsequently to Rome and Milan.

A.D. 372

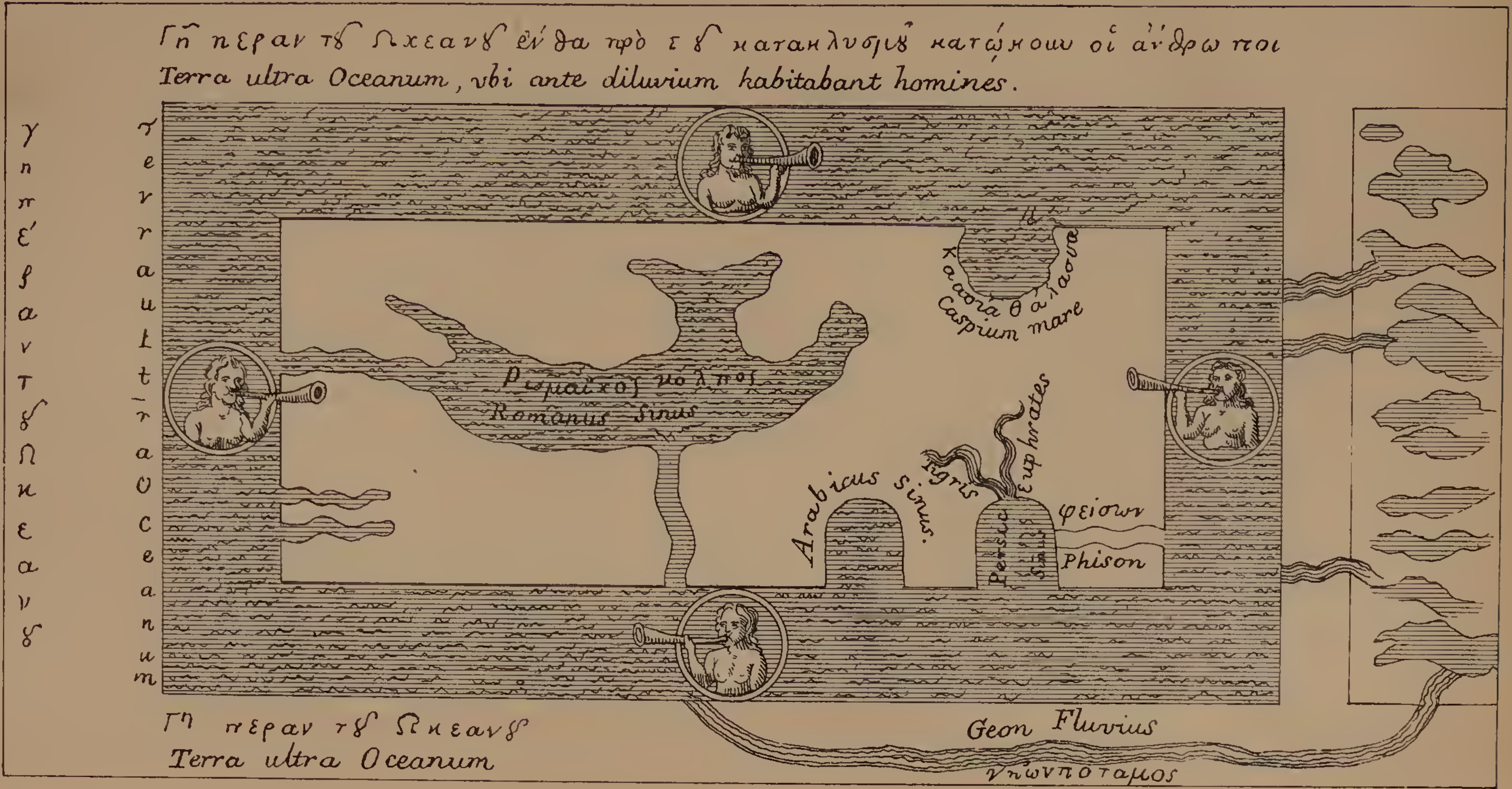
St. Jerome is another example of a notable pilgrim. He journeyed from Rome to Jerusalem in 372, and made a stay of many years there. Paula, visiting St. Jerome, and going with him to the holy places, wrote to her friend Marcella in Rome, 'Here are Gauls and Britons, Persians and Armenians, Indians and Ethiopians, all dwelling in love and harmony.'

As yet the pilgrimage is comparatively safe, easy it cannot be, but the difficulties of the road add to the merit of the undertaking. Some of the pilgrims extend their travels beyond Palestine into Persia, the borders of Arabia, and Egypt, but with all this, knowledge not only remains stationary, but is actually on the decline.

An example of the result of one of these journeys, though not strictly a pilgrimage, is afforded by the 'Christian Topography of the Universe,' written by the Egyptian monk Cosmas. Originally a merchant or trader, it was in this capacity that he made his journeys through Egypt to Abyssinia and to the old trading ports down the African coast, to Syria and as far as India and Ceylon. From the extent of his travels in India he is said to have derived his nickname of Cosmas Indicopleustes, the 'Indian traveller.'

The 'Christian Topography' sets us a new model. Instead of collecting all his travel records into a valuable summary on the old Greek or Roman plans, he starts by laying down as a fact that the earth is flat; and every statement in Scripture which he conceives to bear out this view is piously brought forward in support of his argument. The impious pagans who taught that the earth was a sphere are demolished, and all who share their views are reviled. With an amazing courage he attacks the old theories, and by the aid of his favourite texts shows them to be erroneous. His texts are to hand when he refutes the globular theory of the earth. If it be a sphere, said Cosmas, then there must actually be people on the earth standing 'feet to feet.' The people at the antipodes have the rain falling upwards, and so on. He accordingly drew a picture of four men standing feet to feet—a convincing proof that the notion of a spherical earth was the very wildest absurdity. But more valuable to us than the drawing of the antipodes in derision are the maps or plans actually drawn by Cosmas to represent his world. They are doubtless the very earliest forms of Christian maps that have survived. They bear evidence that the author had not confined himself solely to the words of Scripture, but had adopted some of the old theories by which men sought to account for phenomena they only partially understood. The disappearance of the sun was accounted for by the

THE COSMAS MAP, A. D. 547.



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presence of a huge mountain 'in the north,' behind which the sun went, leaving the earth in darkness until he reappeared the next morning on the other side. What is this but an old story brought to light again ?

The earth, according to Cosmas, is an oblong rectangle, surrounded by the ocean, which is itself surrounded by the outer earth, the seat of Paradise, and described as 'the earth beyond the ocean where men dwelt before the Flood.' Four gulfs penetrate the earth from the ocean, the Roman Gulf, *i.e.* the Mediterranean, the Caspian Sea on the north, the Arabian Gulf and the Persian Gulf, with the Euphrates and Tigris flowing into it, on the south. The rivers that flow into the earth from the lakes of Paradise are also shown, whilst medallions, with figures holding trumpets, represent the four winds.

The value of the 'Christian Topography' to the subsequent progress of geography is nil. The flicker of the light which Cosmas indicates was soon to be extinguished by the irruption of the Arabs with their knowledge derived from the old Greek speculation ; and whilst Christendom remained content to take its earth-knowledge second-hand from Arabic sources, the Arabs were cultivating and extending that knowledge.

This, however, is anticipating events. Pilgrims still continued to flock to Rome and to the Holy Land ; for though the Mohammedans had captured Jerusalem in the year 637, the stream of pilgrims still continued to pour in. The site of the Temple, though the Caliph Omar erected his superb mosque there, was yet held sacred to the Christians.

One of the earliest pilgrims of whom we have any record in this early period of Mohammedan supremacy was the Frankish Bishop Arculf, whose narrative was abridged by our own historian the Venerable Bede, and helped considerably to foster the pilgrim spirit among the Anglo-Saxons.

Arculf began his pilgrimage in the latter part of the seventh century, returning from Syria about 680. Either by contrary winds, or as a settled intention of finishing his pilgrimage by visiting the monastery of St. Columba, he went to Iona, and related the story of his travels to Adamnan, the abbot. The narrative is mainly concerned with the places of interest in the Holy Land, the churches and relics receiving much attention. In Jerusalem was a lofty column, which, 'at midday at the summer solstice, casts no shadow, which shows that this is the centre of the earth.' Arculf of course must have been told this ; it confirmed what the Scriptures said, and he had no reason to doubt it.

A.D. 721 The earliest Anglo-Saxon pilgrim of whom we have any account is Willibald, though we know from St. Paula that pilgrims from Britain had reached Palestine before him. Rome appears to have been the original destination of the pilgrim, but he extended his journey to the Holy Land, by way of Sicily, Ephesus, and Cyprus. We get a glimpse of the difficulties already beginning to be experienced by Christian pilgrims at the hands of the Moslems, causing some two centuries later the combined attempt by Christendom to oust the unbelievers. Willibald and his companions had scarcely set foot in Palestine when they were arrested and thrown into prison, on a flimsy charge of being spies. They found a friend at court after some time, and the Caliph sent for the master of the ship in which they had sailed from Cyprus, and asked him whence the strangers came. 'From the land of the sunset,' was the reply, 'beyond which we know not of earth, but only waters.' The Caliph was wroth that such inoffensive visitors should be detained in prison, and ordered their release, though probably by this time Willibald and his friends had paid their footing.

In returning, the pilgrims touched at the Lipari Islands to see the volcano 'Theodoric's Hell.' Willibald was unable to ascend to the crater, but he saw the flames and smoke, and 'the pumice-stone which writers use' thrown up and falling into the sea, and washed ashore, 'where men gathered it and carried it away.'

The Irish philosopher Dicuil, in his treatise 'The Measurement of the Earth,' also mentions the pilgrimage of a monk named Fidelis, who travelled from the west to Palestine about 750, touching at Egypt on his way, and sailing some distance up the Nile, wondering at the great pyramids, and recounting how he and his party sailed direct from the Nile by the canal of Hadrian into the Red Sea.

The difficulties of the Christians were become more acute by this time, and already pilgrims were forming into armed parties and travelling in companies for protection. Christians and Saracens had come into collision when the Breton monk Bernard made the pilgrimage about the year 867; he mentions the hostel of Charlemagne, 'founded for the use of pilgrims,' in which he lodged at Jerusalem. Bernard reports many wonders and miracles that hè saw in the Holy Land. The fame of most of the holy places had by this time been augmented by wonderful stories which returning pilgrims carried back to their homes. The missionary work of Irish monks at this time is tinged with the same marvellous colouring as attached to eastern pilgrim stories.

A.D. 565 There is a legend, dating from about this time, of an Irish monk, St. Brandan, Abbot of Clonfert, having made an extended voyage on the Atlantic in search of an Island of Saints, which he ultimately succeeded in finding ; and possibly some island may have actually been discovered. The legend is highly fanciful, and bears a striking similarity to the adventures of our old friend Sindbad the Sailor, which have a substratum of truth. Indeed, some of the more remarkable events of Sindbad in the 'Arabian Nights' befall St. Brandan on his voyage. But it was a legend that attained great popularity, and St. Brandan's island of Brassil, the 'Isle of the Blessed,' was actually depicted as lying off the western coast of Ireland on maps even of the sixteenth century.

According to the legend, St. Brandan, with seventeen monks, embarked in 'an osier boat covered with tanned hides and carefully greased.' They visit different islands ; on one they land from the boat and proceed to light a fire, when to their astonishment the island begins to move, and they retreat precipitately to their boat, whilst the island, which proves to be an enormous whale, swims off. Another island they found to be the Paradise of Birds. For seven years they continue the cruise, and at the end of that time are rewarded by penetrating a bank of fog and beholding the Isle of Saints shining with celestial light.

Irish missionary enterprise, though it led the monks to the Orkneys, the Faroes, and even as far as Iceland, was overshadowed if not checked by the daring freebooters from the Scandinavian peninsula who began to scour the seas of north-western Europe about the eighth century. Like the Chinese missionaries who are said to have discovered America from the east in the sixth century, their voyages may have been more fruitful than we are aware of, but they were not part of the Middle-Age European knowledge.

Before the end of the tenth century the Norsemen had thrown out settlements as far as Iceland and Greenland, besides settling down in possession of Normandy, in Ireland and the Orkneys. Barely a century elapses from the first authentic appearance of the Norsemen before they have penetrated with their fleets as far as the White Sea on the north, and threatened the Moslem power of Cordova in 'Spanland,' as the Sagas call Spain. Subsequently, as we know, they penetrated into the Mediterranean, and established themselves in Sicily.

For our present purpose all we can do is to follow the Viking ships and their hardy crews in their attempts at colonising beyond seas. No permanent gain results from their enterprise; the colonies themselves are abandoned, and the colonists return to have their deeds recorded in different Sagas, but not to add much to the sum of human knowledge.

Iceland appears to have been reached by the sea-rover Nadodd in the year 861, and first colonised by an expedition under two foster brothers, Ingolf and Leif, some ten years later, 'in the days of Harald Fairhair.'

A.D. 1000 The discovery of Greenland followed later (985), by a chief named Thorvald and his son Eric the Red. The enterprise of the settlers brought them upon the coasts of America soon afterwards, no less than five distinct voyages being recorded in the Sagas. One about the year 1000 was undertaken by Leif, a son of Eric the Red, and from the quantity of wild vines found growing in the new land, 'Leif named the land after its fruits, and called it Vinland,' and a cargo of grapes and wood was carried away. There can be no doubt that Vinland and Markland, so called because it was well-wooded, are either Newfoundland and Labrador or the immediate neighbourhood.

But the Norse expansion beyond Europe was transient. It not only failed, but faded from memory, and the discoveries of the Vikings in the North Atlantic were no part of the inheritance of the Middle Ages. It is rather the great outburst of energy which stirred up the stagnating blood of Christendom, and sent it coursing at healthy pressure once more, that remained as the valuable legacy of Norse maritime activity. Scandinavia had embraced Christianity by about the middle of the eleventh century, and 'Normans' had settled down to vigorous government of their newly acquired lands, so that when the voice of Peter the Hermit was first raised after the Council of Clermont in 1095, preaching the first crusade, Christendom was ready to listen and to act.

Our own Alfred the Great is a good instance of what could be attempted in those days. A lover of learning, as well as a wise ruler of his people, he found time to send out expeditions for discovery and to make a translation of the cosmography of Paulus Orosius.[1] Othere and Wulfstan are said to have made a voyage to the northern coasts of Europe, which appear to have been practically unknown to Saxons, and to have brought back much information to the king;

'Othere, the old sea captain,
Who dwelt in Helgoland,
To King Alfred, the Lover of Truth,
Brought a snow-white walrus tooth'[2]

as a trophy of the distant lands, and in proof of his having reached 'farthest north.'

Alfred the Great, and a Norseman like Harald Hardrada who had fought no less than eighty battles before he fell at Stamford Bridge in 1066, are types of the thought and energy of the period, and their names fittingly close this chapter.

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[1] The history of Orosius, known as the 'Ormista,' was drawn up within a few years after the capture of Rome by the Goths (A.D. 410), at the suggestion of St. Augustine, with the express purpose of showing that calamities equal to those which had recently befallen the Roman Empire were recorded in all previous ages, and could not therefore be justly ascribed to the introduction of Christianity.—Vide Bunbury, *Hist. of Ancient Geography*, vol. ii. p. 691, note 8.

[2] Longfellow.

CHAPTER III

THE CRUSADING IMPULSE

WE may regard the Crusades as a great movement by a reinvigorated people springing up with a sense of unity from the distinct nations of Christendom which the preceding centuries had seen carved out. Those nations owed much to the resistance, first of all, against the fierce robber bands of Norsemen, and afterwards to the absorption of the Viking spirit of enterprise and adventure.

With the work of the Crusaders in opening up the eastern horizon we shall see the first attempts to penetrate the countries beyond the Euphrates, which had remained sealed to Europe, so far as actual travel was concerned, since the days of Alexander. The pilgrims who go to the Holy Land after the successes of the earlier Crusaders are more enlightened, and bring back some larger perceptions along with the old legends which are still foisted on them. But they carry us ever onwards towards the great time of the Renaissance in Europe.

Islam, too, at this time was declining, the flush of its religious enthusiasm was long past, and Christian Europe was beginning to think for itself, instead of receiving its knowledge from Arabic sources.

With increased facilities commerce began to revive in the Latin kingdoms, and the countries bordering the Mediterranean were the first to profit by the change. Byzantium, which for centuries had been the bulwark against so many invasions, retained the nucleus of trading habits. There had been no occasion for her merchants to travel in search of valuable merchandise; Arabic traders were only too eager to keep the monopoly of trade to themselves.

Arabic enterprise had extended its commercial relations far beyond the limits of Ptolemy's world. Their ships were engaged in carrying products for Byzantine markets from India, Farther India, and China. In Africa they had passed down the eastern coasts below the equator, and had tapped the trade of the rich and fertile Sudan, the Bilad es-Sudan (country of the blacks), as they named it, for gold, ivory, and slaves.

By the contact of East and West, brought about by the Crusades, the whole of Europe profited. It was in the general raising of the standard of life following the Crusades that men's mental horizon became enlarged. And the riches of the East, its gold, silk, stuffs, jewels, and especially spices, became familiar throughout Christendom.

Before we follow the early travellers who penetrated the East, and gave a first-hand account of its treasures, it will be well to glance at the work of the Arabic school in geographical science.

In geography, as in astronomy, the Arabs had worked on the old Greek lines, but on these they had built up their own structures by independent research;

and their knowledge therefore, presented a sharp contrast to Christian knowledge, which had fallen more and more under patristic and ecclesiastical authority.

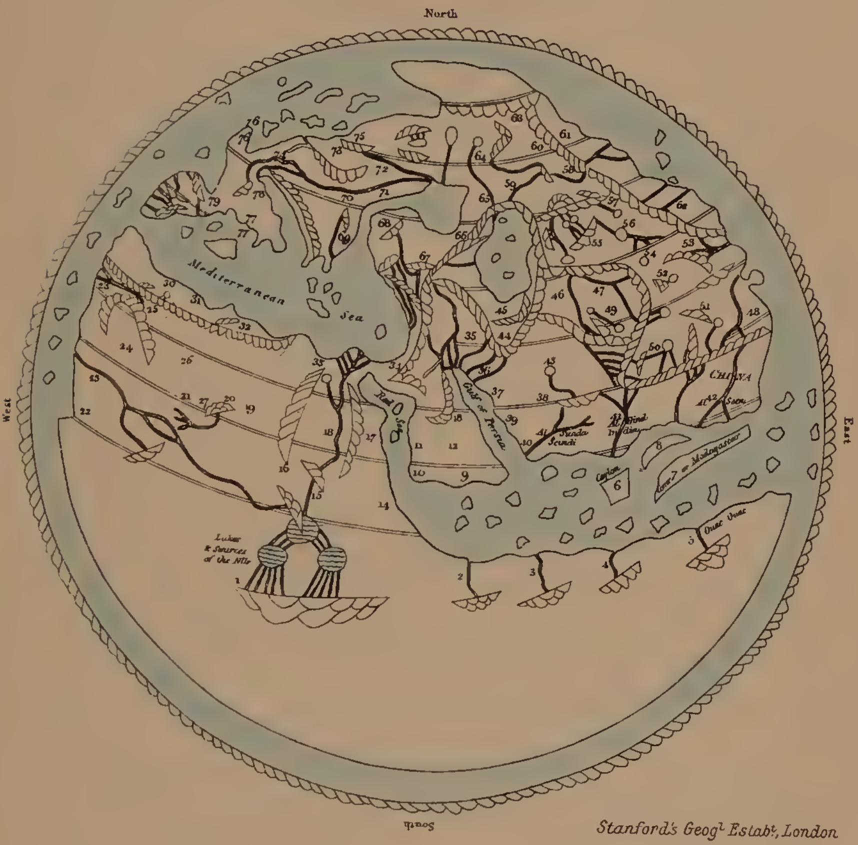
The Arabic materials were much the same as those employed by Greek geographers—mathematical calculation added to reports of travellers, itineraries, and so forth, but leavened with Persian and Indian work and theory.

The conception of a 'world-summit' known as Arim, derived from Hindu sources, for example, is an important point in all Arabic world-systems. It found its way from Arabic sources into the 'Opus Majus' of Roger Bacon, and into the 'Imago Mundi' of Cardinal Pierre d'Ailly, from whence Columbus derived his notion of another world-summit 'over against the mouth of the Orinoco,' as he wrote to his patroness, Queen Isabella. But Arabic geography never got beyond a certain point. It never threw up a truly great writer on the science like Strabo or Ptolemy; what it did was to preserve some of the best traditions of the old thought. One of the important seats of Moslem learning was at Cordova in Spain, where some of the best Arabic scholars wrote their works.

A typical example of the Arabic school is afforded by Aboul Hassan Ali, known as Al Mas'údí, who, about the middle of the tenth century wrote a work known as the 'Meadows of Gold and Mines of Gems.' He had travelled extensively all over the Moslem dominions and outside these so as to embrace the whole of the countries from China to Spain, and from the north of the Caspian to Ceylon and Madagascar.

Arabic Map of the World, 15th Century

From a MS. of Al Edrisi in the Bodleian Library



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His work is rather the gathering together of a mass of material than a strict attempt at a geographical treatise, but he presents us with many points of interest which show the derivative character of his ideas. The unknown southern continent of Ptolemy is one of them ; a discussion on the seven zones or 'climates' is another.

A later Arabic geographer, and one who brings his knowledge into close touch with Western thought, passed the latter part of his life at the Court of the Norman king, Roger of Sicily. Muhammad Ibn Muhammad Al Edrisi, to give him his full name, represents a much later type than Mas'údí, for his work was not written until about the beginning of the twelfth century. Like Mas'údí he held the globular theory of the earth, but he is vastly superior to his predecessor both in theory and practice. Physical features of the countries of the known world were described by Edrisi, from the western coasts of Africa to the east of Asia ; but he adopts the theory of a southern uninhabited zone, and divides his world, in the old fashion, into seven 'climates' intersected by perpendicular lines dividing the climates into eleven parts each. At the Atlantic he stops short, calling it the 'Sea of Darkness,' and relating how attempts made in his time to penetrate its mysteries had resulted in utter failure. It will be seen that the Edrisi map reproduced herewith is taken from a manuscript of the fifteenth century in the Bodleian Library, and is, therefore, much later in date than the original, but it may be taken to represent the Arabic geographer's views ; it portrays clearly the Ptolemaic influence—for example, the lakes and sources of the Nile, and the great extension of Africa eastwards.

The Arabic traveller Ibn Batuta, the last of great Mohammedan travellers, finds a place later on, since his work in the early half of the fourteenth century serves to illustrate more clearly the Christian work going on side by side with the expiring Moslem energy.

An early traveller from Western Europe has left us an account of a journey to the East made during the
A.D. 1160 years 1160–1173, from which we get a much wider view than the pilgrim-travellers had given; though, curiously enough, it is the son of a Jewish Rabbi who made the journey, and not a crusader in quest of adventures. Benjamin of Tudela, as he is named, conceived the idea of making a tour, and estimating the number of his co-religionists in the world; and he carried out his task with commendable energy. Benjamin began his travels from Saragossa, 'and proceeded down the river Ebro to Tortosa,' thence to Italy, Greece, to Constantinople, a city that greatly impressed him: 'great stir and bustle prevails at Constantinople in consequence of the conflux of many merchants who resort thither, both by land and by sea, from all parts of the world for purposes of trade.' From there Benjamin visited the Greek islands, and then passed on into Asia Minor, to Jerusalem, Damascus, and Baghdad, beyond which place it is doubtful if he went, although he mentions Jews as living in such distant parts as Malabar and Ceylon.

After a stay of some three years in Baghdad he returned westwards by way of Arabia and Nubia to Egypt. In describing the town of Alexandria he says:

'The port of Alexandria is formed partly by a pier, which extends a mile into the sea. Here is also a high tower, called lighthouse, in Arabic, Minar of Alexandria, on the summit of which was placed a glass mirror. All vessels which approached with hostile intentions, from Greece and from the western side, could be observed *at fifty days' distance* by means of this glass mirror, and precautions were taken against them.'

From Egypt Benjamin sailed to Sicily, and travelled northwards through Italy into Germany before finally returning to Spain. But throughout the whole of his travels, although he notices many objects of interest in the places through which he passes, he never loses sight of his main object; his fellow Jews are naturally of more consequence to him than the geography of the countries where he found them dwelling. It is a wonderfully accurate record, if no more; and the travels of 'Rabbi Benjamin of blessed memory' are interesting if not valuable as falling within this early period.

More than half a century elapses between the time of Benjamin of Tudela and our next important traveller. But when we come to John de Plano Carpini we have reached a very important time, since he stands as the precursor of Marco Polo, and the pioneer of European intercourse with unknown Asia.

In order to understand the full significance of Carpini's work in land travel it is necessary to glance briefly at the events which were happening in the East at his time.

The Crusades still dragged on, though the fierce enthusiasm of Franks and Saracens had cooled, and both had profited by intercourse. But a new element suddenly appeared when news of a great commotion on the plains of Central Asia began to spread.

One of the most remarkable events of that time was the rise of the Mongol power in Asia, and the great invasion under Genghis Khan, the 'Scourge of God,' as he was called in his own day, the 'Second Attila,' as a modern French author has well named him.[1]

After conquering an immense region of Asia, the barbarian hordes of Mongols, or Tartars, led by Genghis Khan's successors (he died in 1227), threatened to overrun the whole of Europe. Russia, founded by the old Norse rovers, was subdued, and the invaders penetrated into Hungary and Poland, and Western Europe began to tremble in face of the amazing storm when the Tartars turned their arms against Turks and Saracens alike. At once Christian Europe saw the advantage to be gained from an alliance with the fierce conquerors against a common enemy, the Saracen, and the Pope Innocent IV. sent missions to the Tartar camp to secure this alliance and convert the heathen warriors.

The missions to the 'purple East' failed in their primary objects, but the friars brought back much information respecting the countries and people of Asia, and, by exploding many old fables of the Asiatic tribes and the nature of the country, added to geographical knowledge, and paved the way for European trade and commerce.

One of the earliest and most important of these missions, so far as our present purpose is concerned, was that of the Minorite friar John de Plano Carpini, who afterwards became Bishop of Antivari in Dalmatia.

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[1] M. Léon Cahun.

A.D. 1245

Beginning the journey in 1245, Carpini and his fellow monks made their way into Bohemia, Silesia, and thence to Russia, where they obtained guides, and continued eastwards towards the nearest Tartar camp. 'We were obliged to hire sledges to be drawn over the snow,' says Carpini—for it was mid-winter. They reach the outlying camp, and are passed on from one dignitary to another, Carpini marking the while the ruins of many towns and castles, 'the roving Tartars from the northern parts having in a manner totally destroyed them.' At length they reach the court of the Great Khan, 'after travelling over many dreadful mountains covered with snow,' and are accorded an audience. The friars present 'the furs and such other things as we had brought;' but there was so vast a crowd of ambassadors from the dependent Tartarian princes, 'some from Russia and others from Persia and China,' that the presents were not thought of much account. 'On a neighbouring hill, near where the Emperor's tent was pitched,' says Carpini, 'we saw no less than 500 wagons loaded with presents, such as furs, fine cloths, silks, and many other articles.' In fact there seems to have been a perfect glut of presents from chiefs anxious to propitiate the conquerors.

Carpini's geography is far from accurate, hazy for the most part, and such as we should expect to find in a traveller whose experience had hitherto been mainly of the cloister. Yet despite this drawback, and the fact that he was penetrating an unknown and dangerous country, he made good use of his eyes, and gleaned some knowledge of the country beyond the range of his journey, which actually extended to Karakorum, beyond Lake Baikal. 'Mongolia, in the east part of the world,' is one of his vague expressions, although he speaks more accurately of Cathay as 'a country in the east of Asia.' But whatever his defects, his 'Book of the Tartars' had a value as the work of a genuine ambassador. He lived in an age when men were not free from the old superstitions; he himself spoke of the dog-faced men said to live in the northern regions, but he certainly helped to dispel many of the wilder legends.

A.D. 1253 In June 1253, another friar, William de Rubruquis, was sent on a long journey across Asia in the capacity of envoy from St. Louis of France, who was at that time engaged in his crusade in Palestine. Rubruquis and his companions appear to have gone northwards at first towards the Don, and after a troublesome journey of two months to have reached the Tartar camps on the Volga, where they were accorded an interview with the chieftain, Batu Khan, in command. The friars were directed to go forward and carry their letters to the Grand Khan, who had his court at Karakorum, and guides were sent to accompany them.

Rubruquis mentions many places that struck his attention as he and his companions rode on their long journey, and names many of the tribes whom they encountered. At Karakorum were many prisoners and traders from Persia, India, China, and Thibet. Orthodox Rubruquis was much impressed at the widely spread followers of Nestorius, who had established themselves in Persia, Arabia, India, and China long before.

The Caspian Sea, which had always been regarded either as an arm of the 'northern sea' or as connected with it by an outlet, was proved by Rubruquis to be really an inland sea; he appears to have been the first to establish this. The visionary Prester John, that will-o'-the-wisp of the Middle Ages, who Carpini had thought might be found in India, again took flesh with Rubruquis, for he brought him to life in the person of a brother of Ungkhan, one of the Mongolian princes who was supposed to have embraced Christianity.

The tide of the devastating Mongolian invasion had reached its highest mark and had begun to recede by the middle of the thirteenth century, but the Tartar power remained dominant for many years over a vast belt of territory east of the Volga. Genoa and Venice profited by this to open up commercial relations with the Tartar princes.

Already the heart of Asia was beginning to be better known by Europeans. The year after Rubruquis had set out on his mission Venice had given birth to a son—Marco Polo, the 'Columbus of the East Indies,' as Pinkerton well names him—who was to undertake and accomplish one of the most extensive journeys ever made, and extend the knowledge of Asia to some good purpose.

About the year 1254, two young Venetian nobles, Nicolo and Maffei Polo, started on a trading enterprise from Venice, 'and having traversed the Mediterranean and the Bosporus, they came, with a fair wind and the blessing of God, to Constantinople.' Here they decided to extend their operations by crossing the Black Sea and going to the Tartar settlements.

They travelled across the Crimea in a north-easterly direction, and reached the camp of Barkai, a Mongolian prince, at Sarai, who was delighted with the precious stones the Venetians brought him, and treated the travellers with much kindness; but their return westwards was interrupted by the unsettled state of the country, and they made their way to Bokhara, where they fell in with envoys returning to the court of the Great Khan Kublai, and the merchants were promised 'great honour and profit' if they would accompany the envoys to court. The brothers set off with the envoys, and after twelve months' hard travelling reached the court of Kublai, though it is a little doubtful at which of his courts the brothers were presented. The seat of government had been removed by Kublai from Karakorum, on the distant Tartary plains, to the more populous Cambulac (Peking) in China, and he had built a summer palace, his 'stately pleasure dome,' as Coleridge called it, at Shangtu, in the cooler hill-country to the north-west of Peking.

Arrived at the court of the Khan, however, they were treated kindly, and to their great delight were asked by Kublai to act as bearers of letters from him to the Pope. They took leave of the Emperor, and after some three years got back to Acre (in 1269), where they learnt that the Pope, Clement IV., was dead.

They decided to await the election of a new Pope, and occupy the interval with a visit to their own country.

Marco Polo here comes on the scene as a young man of fifteen, and we can imagine the delight he took in listening to the travel stories of his father and uncle, and how his ambition must have been stirred by their description of the Far East, the distant Cathay, with its peoples, and manners, and customs so utterly unlike the surroundings in which he had been reared. The ways of life of the wild nomadic tribes of the Asiatic steppes must have appealed with force to the Venetian town-bred boy, and no doubt he begged to join in the return. At all events he accompanied his father and uncle when they decided to recommence their long journey. Making their way to Acre, they were at length furnished with letters from the newly elected Pope, together with certain relics; two monks were also appointed by the Pope to accompany the Polos. The monks, however, were terrified at the prospect, and turned back before proceeding very far.

Before the end of 1271 the travellers were well on **A.D. 1271** their road making their way eastwards across the Euphrates to Mosul (Nineveh) on the Tigris, then following the river down to ancient Baghdad, and to Ormuz at the head of the Gulf of Oman. Here they turned northwards again, though their plan seems to have been to take boat at Ormuz and so make the journey to China by a sea route.

Through Persia to Balk and Khorassan the travellers pushed their way north-eastwards towards the head waters of the Gihon (Oxus), but here the effects of the arduous journey began to tell upon the young unseasoned Marco; he fell ill with a low fever, and a whole year was spent at Badakshan while the young man rested and recovered in the exhilarating air of the mountains.

Resuming the journey in high spirits, the little party directed their steps towards the Pamirs, the 'roof of the world.' These great highlands were successfully crossed, and the travellers descended to Kashgar and Khotan, and faced the great desert of Gobi. The solitudes of the desert and its terrors to travellers are remarked by Marco as they cross the sandy waste of Gobi. 'After you have travelled thirty days through the desert you come to a city called Saichu, in a province called Tangut.' Here the Venetians were met by envoys sent out to meet them by the Khan, who had heard of their approach, and they soon afterwards found themselves in the presence of Kublai, who was delighted at their return, and especially pleased with young Marco. It was May of 1275 before the travellers reached the Court, the long journey from Acre having occupied nearly three years and a half.

Marco Polo's activity was soon displayed in acquiring a knowledge of the languages spoken at the capital, and he became so useful to the Khan by his quick-witted perceptions that he was entrusted with the charge of missions to distant parts of the Khan's dominions, and at one time was governor of the city of Yangchau. But to us his journeys during the years he remained attached to Kublai are of supreme importance, since his experience gained by them was of immense value to geographical knowledge in after years when the story of his life came to be written down from his own lips by Rusticiano. Indeed the boundaries of his geography are the boundaries of Asia itself. He describes all the countries from Syria westwards to China and Japan, and northwards to Siberia and the Frozen Ocean. The Indian peninsula, with Ceylon and the great islands of Java and Sumatra, and even some account from hearsay of Abyssinia, Zanzibar, Madagascar, are also first spoken of by a trustworthy and accurate observer.

Many years elapsed before the Polos were able to retrace their steps to European friends. The Khan would on no account part with his useful officers, but the homing instinct was strong within them in spite of all their honours and riches. Their return was ultimately brought about by Kublai being visited by ambassadors from Arghun, King of Persia, asking for a Mongolian bride to replace a favourite wife who had died. Kublai selected one of his granddaughters, and as the journey across Asia was considered unsafe, the sea route was chosen, and the Polos, representing the Khan, embarked with the Persian envoys, having the young bride and a large suite in their care.

The fleet set sail in 1292, the Khan bidding farewell to the Polos with much regret on his part. Past Java Major, Java the Less, and so on with many difficulties to the Bay of Bengal and on to Persia, taking more than two years to accomplish the voyage. On arriving they found that the king Arghun was dead, and his brother on the throne. Ghazan, the son of the new king, won the hand of the lady traveller, and to him they delivered their charge. After remaining here some time the travellers set out for home, passing through Armenia to Trebizond, Constantinople, Eubœa, and regained their native and beloved Venice at the end of 1295.

Their long absence and the travel-stained dress in which they appeared marked them as foreigners, and no one was inclined to believe their story that they were the long absent Polos. Their own relatives failed to recognise them as such; but they came back wealthy, and determined to put their wealth to a curious use. The story of their expedient to obtain recognition was first recorded by Ramusio, a geographical writer, nearly two centuries afterwards, so that it may not have much solid foundation. But it is an interesting tradition, if it be no more.

A great banquet was prepared for them, says Ramusio, to which they invited all their relatives and friends. At first the three came in dressed in long robes of crimson satin, but they changed their dresses three times during the meal, and each time gave away to the servants the dresses and robes they had discarded, to the great astonishment of the guests. The climax was reached when Marco, the youngest of the three strangers, rose from the table, and, going out, brought in the three coarse cloth surcoats in which they had travelled over so many miles. Immediately they began to rip open the seams and tear off the lining, whence there poured forth a great quantity of precious stones, rubies, sapphires, carbuncles, diamonds, and emeralds, which had been sewn into each coat with great care. The exhibition of such an extraordinary and infinite treasure of jewels and precious stones, which covered the table, says Ramusio, once more filled all present with such astonishment that they were dumb and almost beside themselves with surprise, and they at once recognised these honoured and venerated gentlemen of the Ca' Polo, whom at first they had doubted, and received them with the greatest honour and reverence. When the story was spread abroad in Venice, the entire city, both nobles and people, flocked to the house to embrace them, and to make every demonstration of loving-kindness and respect that could be imagined.

The narrator of the story goes on to tell how the surname Marco Millione, or 'Marco of the Millions,' came to be given to Marco Polo from the fact that in his oft-repeated story of the grandeur of the Great Khan he stated the revenues of that prince to be from ten to fifteen millions in gold, 'and counted all the other wealth of the country always in millions.'

The fame of the travellers quickly spread, and Marco was continually asked to recite the history of his surprising adventures and travels. At length he determined to commit his narrative to writing. The way in which his book came to be written was owing to an accident. Some three years after his return to Venice he took part in a naval battle with rival Genoese ships, and was taken prisoner. In the prison at Genoa, Marco Polo, with his store of travel story, must have been a treasure to his fellow captives. One of his fellow prisoners, Rusticiano by name, wrote down the story of Marco's travels as he told it from day to day. It is

supposed to have been completed and first circulated
A.D. 1298 about the year 1298.

Many at first accused Marco Polo of exaggeration, but every one was interested in his narrative, and as the progress of discovery continually tended to confirm what he had said, his authority became more and more marked, and the influence and fascination of the wonderful regions of the East gained greater sway over men's imaginations.

'The work of Marco Polo,' says Mr. Beazley,[1] 'is the high-water mark of mediæval land travel; the extension of Christendom after him was mainly by the paths of the sea. . . . Before Polo returned from China, the coasting of Africa had begun, and Italian mariners were already in search of the longer way to the East. But there is no work of land travel after that of Messer Marco which really adds anything decisive to European knowledge before the fifteenth century.'

A.D. 1318 The great continent of Asia continued to attract travellers during the thirteenth and fourteenth centuries, but there are few names that call for attention. Oderic of Pordenone, a Minorite friar, is said to have passed through every country of Asia from the shores of the Black Sea to China, beginning his travels in the year 1318. After his return in 1330 he dictated an account of his travels to William de Solana at Padua, but his narrative added nothing to geographical knowledge that was of any value. His account of the magnificence of the court of Peking confirmed the more authentic narrative of Marco Polo.

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[1] *Prince Henry the Navigator*, pp. 103–4.

Side by side with the work of Marco Polo, a work, as we have seen, the result of that great crusading epoch, we may compare the travels of Ibn Batuta, the last of the great Arabic travellers, who closes the doors, as it were, of the great school of Arabic geography and science.

Christendom had risen as Islam decayed. The Crusades, which had been the result of a great vitalising influence, had established the trade of the Mediterranean. From Spain to the Levant all the coast towns had profited ; some in particular, like Marseilles, Genoa, Amalfi, and Venice, had built fleets for the transport of warriors bound for the Holy Land, and had established a regular maritime trading intercourse.

The long and extensive journey by land and sea of the Sheikh Ibn Batuta had for its prime motive the pilgrimage to Mecca ; and whilst he is the best type of purely Arabic traveller, and is indeed one of the famous travellers of his period, it is doubtless true that in his own time his work was matter of interest only to his own co-religionists.

To crusading Europe the Moslem Ibn Batuta had little or no value. Had he been a Christian knight the case might have been different, and we must bear this in mind in estimating the 'expansive force' of his labours. Apart from its geographical value, and this itself is not inconsiderable, the account of his travels is distinctly Oriental in character, and it presents us, therefore, with an epitome of Arabic ways of thought that enhances its value.

According to the existing manuscripts, one of which is preserved in the public library of Cambridge—manuscripts which are, however, abridgments of longer and better accounts—Ibn Batuta set out from his native city of Tangier in the year 1324–1325 to make the pilgrimage to the tomb of the Prophet as became a pious Mohammedan. 'In the name of the compassionate and merciful God' is the devout invocation which begins the narrative, quite in the genuine pilgrim spirit.

Across the northern countries of Africa to Alexandria was the first stage. Then the cities of the Delta were visited, the Nile puzzling our traveller somewhat because, 'contrary to all other rivers, its course is from south to north.' From Cairo southwards through Egypt to the borders of the Nubian Desert, thence back again down the Nile to Cairo. Across the Isthmus of Suez by the old road into Syria, the road which Joseph had travelled with Mary and the Infant Christ on the Flight into Egypt; by Raphia and Gaza to Tyre, a strongly fortified place 'surrounded on three sides by water;' and Baalbec, the ancient Heliopolis, to Damascus. Now he joined a caravan going to Medina, but he broke off before reaching there and made an excursion to Basra (Bussorah), Shiraz, and Baghdad, where he saw the traces of the Mongolian invaders, who, sixty years before, had sacked the city. Then away north to Tabriz, in the province of Azerbijan, the seat of the ancient fire-worshippers of Persia. Turning south again he headed straight for Medina, to the tomb of the Prophet, and reached Mecca, the 'Holy City,' where he remained for three years.

After this rest he joined some merchants going south to the Yemen coffee districts, and being close to the African mainland again, he crossed over the Red Sea to Abyssinia and extended his sea trip round the coast to Zanzibar, then altered his course to Arabia and sailed for the Persian Gulf, touching at the ancient Ormuz. From Persia he made a second pilgrimage to Mecca, and we afterwards get an account of an extended journey back through Asia Minor, and thence to a Mongol camp and the town of Bulgar.

Of more importance to us is the account of his longer journey eastwards to China. It extends from the European spurs of the Caucasus to Astrachan, Bokhara, across the Hindu Kush to Cabul, and thence into the Indian peninsula, where Ibn Batuta found service under the ruler of Delhi, by whom he was sent on an embassy to China, taking the sea route and sailing down the western shores of India past the Maldive islands to Ceylon and China, with minor excursions and adventures by the way to his heart's content. In retracing his steps he travelled through Java and Sumatra to India again, Arabia, Syria, to Cairo, Alexandria, and Fez. But he made yet another circuit nearer home, visiting Spain and then striking into Africa and making his way through Nigeria back to Fez, where he settled down in 1353 to a quiet life after his thirty years of travel. It is estimated that he traversed no less a distance than 75,000 English miles.[1]

Superstitious and addicted to the marvellous his narrative shows him to be, but if we make allowance for this, as we must in travellers of those days, his story remains of value. He has many anecdotes. In Jerusalem he visited the tomb of Abu Yaakub Yusef, supposed to have been one of the 'kings of the East,' and relates a story he heard there. Abu Yaakub, touched by the sad case of a man with a marriageable but dowerless daughter, directed the girl's father to collect all the copper articles about the house, and to borrow as many more as he could from the neighbours. A considerable quantity was produced, and Abu Yaakub dug a hole and put the copper articles into it. On this he made a fire which fused the metal ; then taking some elixir he had with him and putting it upon the metal, the whole became pure gold !

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[1] Sir Clements Markham.

But the marvels related by Ibn Batuta were not to be compared with those related by our own Sir John Maundeville, whose racy narrative of his travels and adventures in the East dates from the year 1356, contemporary almost with the Moslem traveller. But whilst Ibn Batuta remained almost unknown, Sir John Maundeville was widely read and enjoyed.

Born at St. Albans in the year 1300, he travelled for some years in the East, though the particular countries he actually traversed, and the real extent of his journeys, are difficult to ascertain. His 'Travels' contain an account of all he had seen or claimed to have seen, but, like the Middle-Age maps, his book is filled with legends and fables gleaned from old writers or from hearsay. Maundeville himself, in the prologue to his work, says that he has been a long time over the sea ; 'and I have gone through many divers lands, and many provinces and kingdoms, and isles, and have passed through Tartary, Persia, Ermony (Armenia) the Little and the Great; through Lybia, Chaldea, and a great part of Ethiopia; through Amazonia, India the Less and the Greater, a great part; and throughout many other isles that are about India, where dwell many divers folks, and of divers manners and laws, and of divers shapes of men.'

The 'divers shapes of men' were certainly remarkable. Some had flat faces, some had but one eye, whilst others had their mouths and eyes between their shoulders—in short, all the old myths and fables dished up again from older writers like Solinus the Fabulist, and Pliny, and Friar Oderic! But Sir John Maundeville proved acceptable to credulous readers; his stories, with a golden thread of truth running through them, appear to have been popular through the fourteenth and fifteenth centuries. Indeed, as a recent editor of the worthy knight remarks, there are now in the British Museum alone 'close on a hundred different printed editions and versions of his book, in English, French, Italian, Spanish, Dutch, Walloon, German, Bohemian, Danish, and even in Irish.'[1]

The enterprise of Europe, *i.e.* Southern Europe, with Venice for a focus, set in life again first of all by the crusading impulse, and growing more important with the extension of maritime traffic in the Mediterranean, received fresh stimulus from missionaries like Carpini and travellers like Marco Polo. Venice in particular became the great mart for gathering in the products of the East, which had become necessaries, and distributing them to North and West.

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[1] J. G. Grant in Layard's *Maundeville*, 1895.

That enterprise found its most remarkable outlet in Portugal. The Far East held men's imaginations in thrall. From the East all the more precious and costly articles of commerce found their way by land and sea to Venice, and jealousy of a wealthy trade rival may have lent its aid in fostering the longing to tap that trade. North-Western Europe, owing to its very situation, was shut out from a large share of the Eastern trade, though the towns of the Hanseatic League were in close touch with their more favoured neighbours. Whether the treasures of the Far East found their way to the Levant by sea or by the great land routes is of little importance; the point is that European merchants had to turn eastwards.

Yet though Venetian and other Italian and Spanish fleets had so lucrative an industry, it was confined to the waters of the Mediterranean, and had no wider area than the Phœnician and Carthaginian fleets of centuries before.

But the time was at hand when the spell of the 'Sea of Darkness' was to be broken. Already attempts were being made by Genoese, by Catalans, and others to break away from the land-locked Mediterranean and explore the African seaboard washed by the Atlantic.

Before the fourteenth century closes we hear the thunder of the Atlantic rollers beating on new-discovered isles, and breaking on hitherto inaccessible coasts and headlands; the 'impassable' torrid zone is penetrated, cautiously and with great misgiving at first, but afterwards more courageously, and we are in sight of some of the most brilliant epochs of discovery, epochs associated with the immortal names of Prince Henry of Portugal, surnamed the 'Navigator,' Christopher Columbus, 'the discoverer of a new world,' Vasco da Gama, the pioneer of the first voyage to India by way of the Cape of Good Hope, and Ferdinand Magellan, the first circumnavigator of the globe.

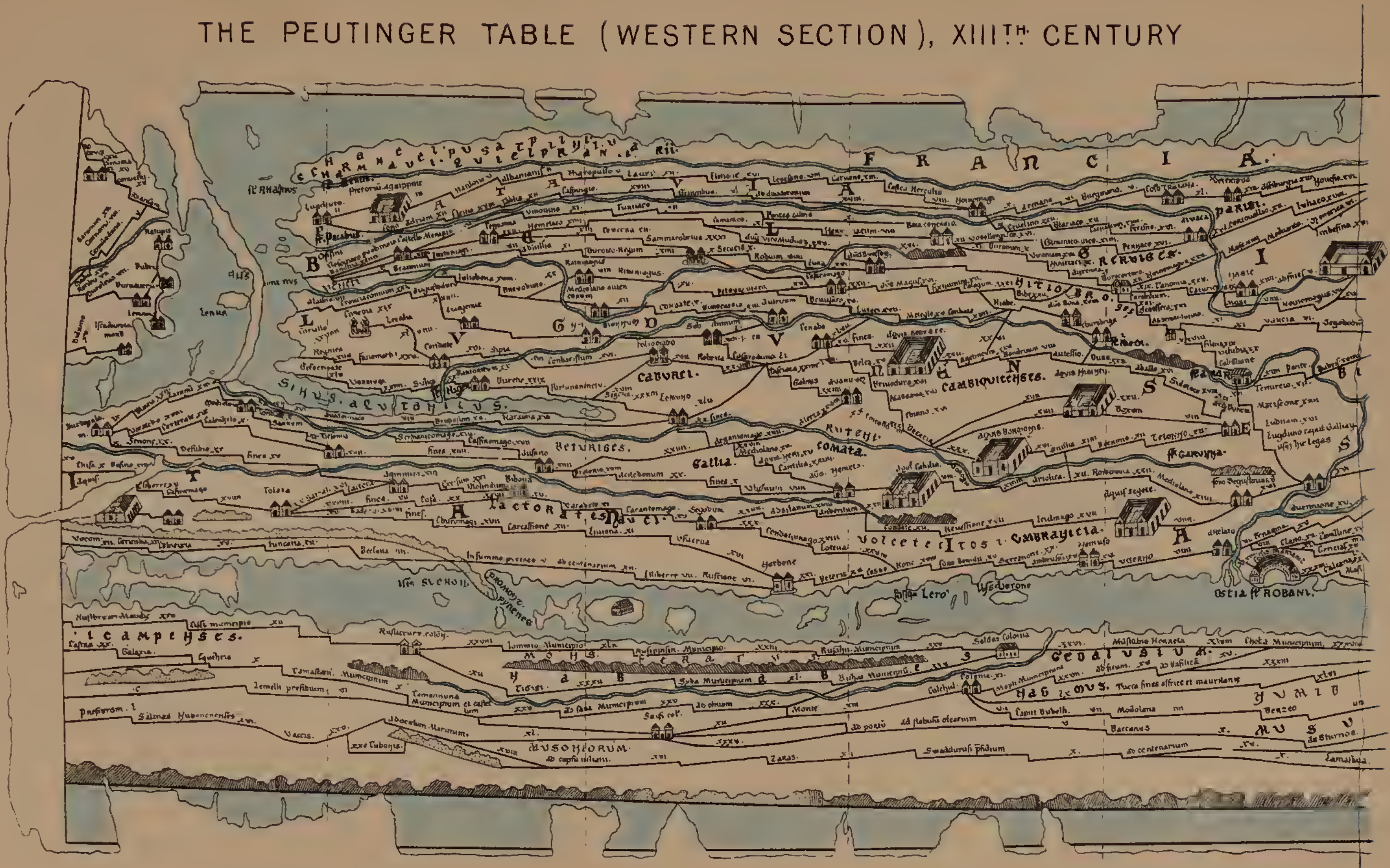
CHAPTER IV

EARLY AND MEDIÆVAL MAPS

BEFORE passing to the work of Prince Henry the Navigator we may here glance briefly at the maps of the Middle Ages and note some of their peculiarities. They will afford us a clearer insight into the theoretical state of geographical science, and they have an important bearing on one of the branches of the work to which Dom Henry set his hand. Moreover, they indicate so clearly the state of the special views they were intended to illustrate, that they have a distinct bearing upon the work of Henry of Portugal.

We have seen how the Greek idea of the world, which came to so high a standard with Ptolemy, failed to pass on to Christendom. The Roman models, useful no doubt from a military point of view, aimed rather at the collection of written accounts of roads, towns, forests, streams, and suchlike, and if a picture to illustrate these were drawn at all, it took the form of a long scroll on which the roads were greatly drawn out, so as to allow the artist to insert all the features that a traveller would particularly wish to know. It was of more importance to the traveller to reach a town where he could find protection from robbers during the night

THE PEUTINGER TABLE (WESTERN SECTION), XIIIᵀᴴ CENTURY



London. Edward Stanford, 26 & 27, Cockspur St. Charing Cross, S.W.

than it was to have a picture of the world presented to him.

This form of map survived for many centuries. A celebrated one drawn on eleven sheets of parchment was discovered in 1507, and is now preserved in the Imperial Library at Vienna. It shows the roads and countries from Britain in the west to the neighbourhood of India in the east.[1]

From having been formerly in the possession of one Conrad Peutinger, of Augsburg, it has acquired the name—Peutinger Table. The date of its compilation is doubtful. Dr. Miller ascribes it to Castorius, a Roman geographer referred to by an anonymous geographical writer who lived at Ravenna in the seventh century, and if this be correct the map dates from the time of the Emperor Valens in the fourth century. On the other hand it has been held that the work is simply a copy of an older map and, in fact, belongs to the thirteenth century.[2] Even if this be so, the Peutinger Table perpetuates the plan of the older Roman maps already referred to, and therefore carries us back to the early centuries of the Christian era, if not beyond.

In the Peutinger Table everything is subordinate to the roads, the delineation of these being the primary feature of the map. From the western section, containing the south-eastern corner of England, which is reproduced herewith, the peculiar elongated feature of the whole will be perceived. Where the roads enter a town the latter is represented by towers, generally two in number, though the larger towns and fortresses are indicated by larger vignettes so as to convey an idea of their relative importance. Thus the three imperial cities, Rome, Constantinople, and Antioch, are larger than any others on the map, and are embellished with figures seated on thrones, crowned and holding sceptres. A host of other features are inserted, such as rivers, forests, harbours, and baths.

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[1] Only a fragment remains of the first or western section, but Dr. Miller has ingeniously attempted to restore it by a drawing made on the same plan as the existing sections. Those who are curious to learn the probable shape that the British Isles assumed in this interesting map will find the restored section in *Mappemundi: die ältesten Weltkarten*, Part VI., plate 5, Stuttgart, 1895, *et seq.*

[2] See Beazley's *Dawn of Modern Geography*, p. 381.

Quite different from the route-charts is the world-portraiture of a monk like Cosmas, and it is this type of map or world-picture—the mappa-mundi—with which we are more particularly concerned. Though the world-map of Cosmas displays but the crudest notion of the earth, the form is closely repeated in the earliest mappe-monde that has come down to us—viz. the mappe-monde preserved in the library of Albi in Languedoc—though it is doubted whether the two have anything in common.[1] The value of the Albi mappe-monde is that it dates from the eighth century. The world as drawn has a square shape with rounded corners, and the ocean encircles it. An attempt has been made to show the situation of the more important countries, and though they are hopelessly distorted there is an idea of sequence, and we get a rough idea of their relative situations. Britain occupies one of the corners off the coast of Spain, being drawn in a circular shape

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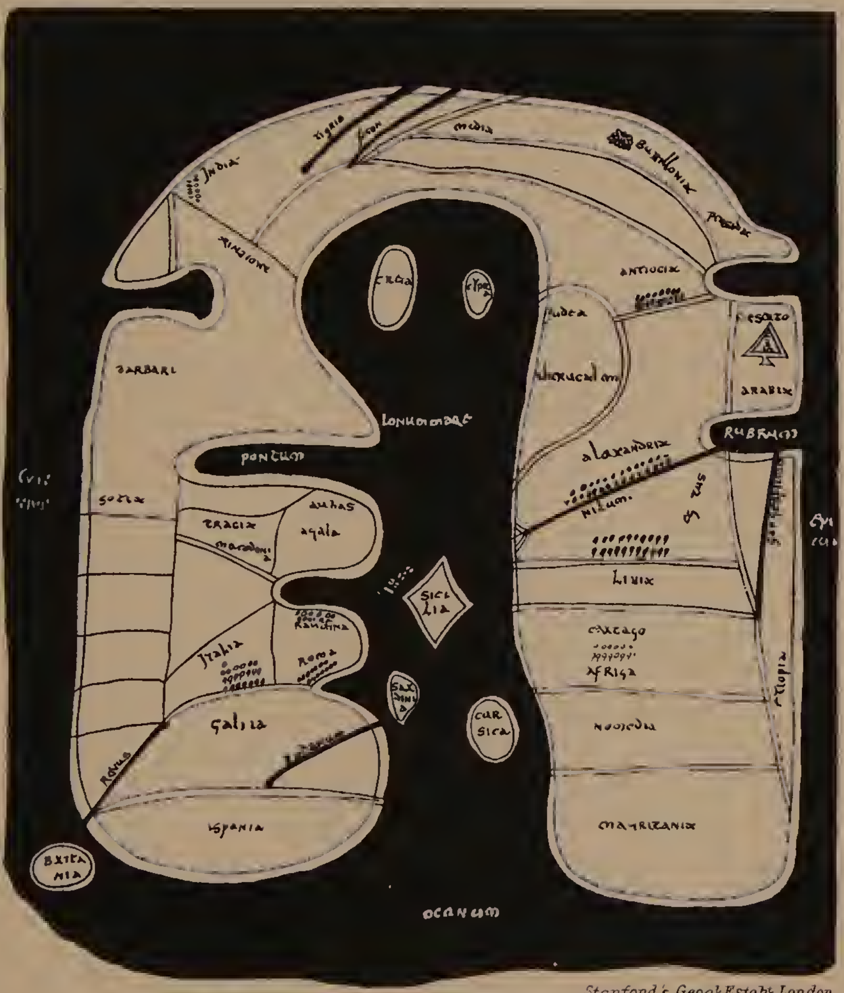
[1] See Beazley's *Dawn of Modern Geography*, pp. 385-6.

MAP OF THE WORLD VIIIth Century

From a MS. in the Library of Albi, in Languedoc.



Stanford's Geogl. Estabt., London

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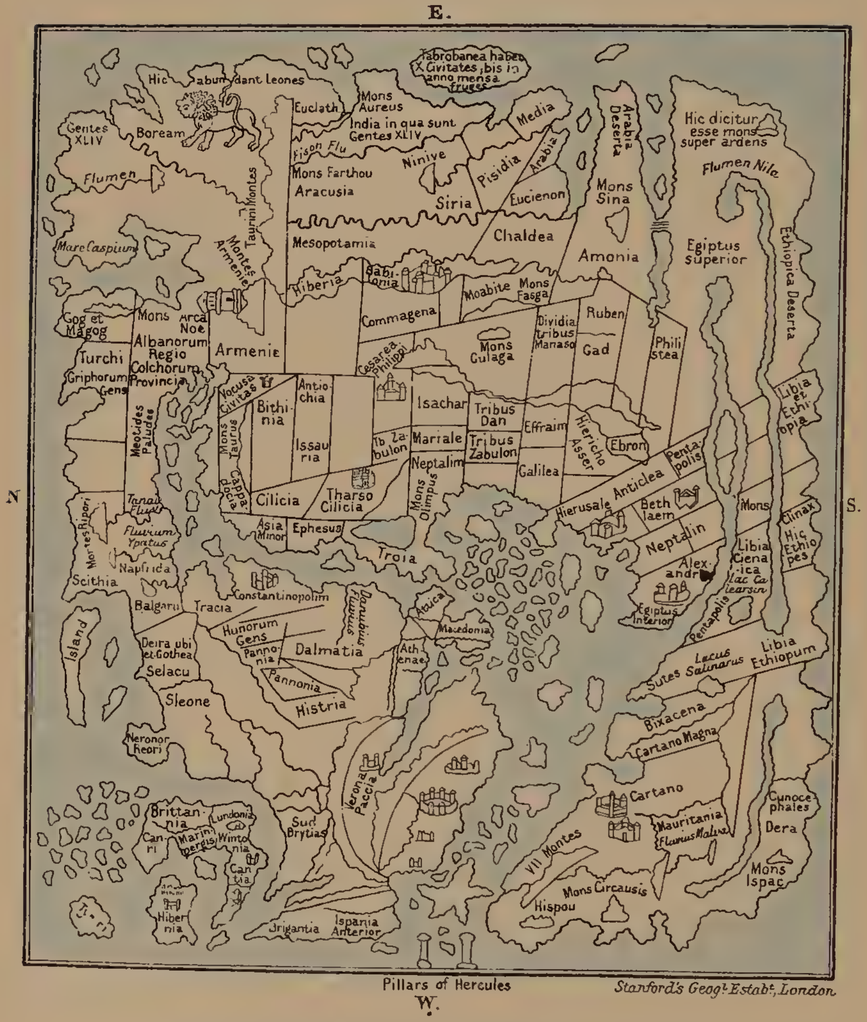
ANGLO-SAXON MAP OF

THE WORLD

Xth Century



Stanford's Geogl. Estabt., London.

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of about the same size as Corsica, one of five islands depicted in the Mediterranean.

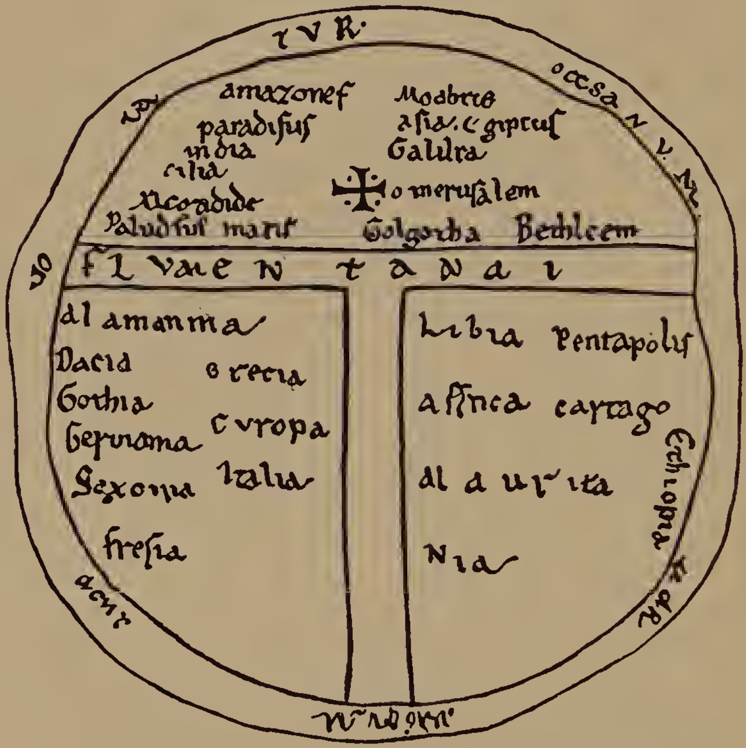
A more ambitious attempt at map-drawing, and one that shows a considerable advance on the Albi mappemonde, is one preserved in the British Museum, and known as the mappe-monde of St. Sever, dating from the ninth or tenth century. The form of the world in this map becomes oblong, but retains the rounded corners of the earlier example. The names of countries are sparse, but the artist has inserted pictorial aids in the shape of castles to represent walled towns, and besides the fishes and boats that find a place in the encircling ocean, the Terrestrial Paradise, with Adam and Eve, occupies the centre of the eastern portion of the picture. Whether Paradise is inserted or not, the orientation of nearly all early and mediæval maps is one of their distinctive features. Paradise at the top and Jerusalem at the centre serve as two main points from which to construct the map. The St. Sever mappe-monde, and several others of later date that closely resemble it, are supposed to be derived from a lost prototype ascribed to a Spanish monk Beatus who lived in the eighth century. The oldest surviving derivative is that known as the Ashburnham map.

Another example of tenth-century mappe-monde is also in the British Museum, and is known as the Anglo-Saxon map; but in this Paradise is omitted, and its place is taken by Taprobane (Ceylon), and Jerusalem, though near the centre, has not its usual accurate centrality.

The shape of the Anglo-Saxon mappe-monde is nearly square, being eight and a half inches long (east to west) and seven inches broad. It presents a mixture of Biblical and classical geography; for whilst we have such places as Jerusalem and Bethlehem inserted, and

THE STRASSBURG MAP

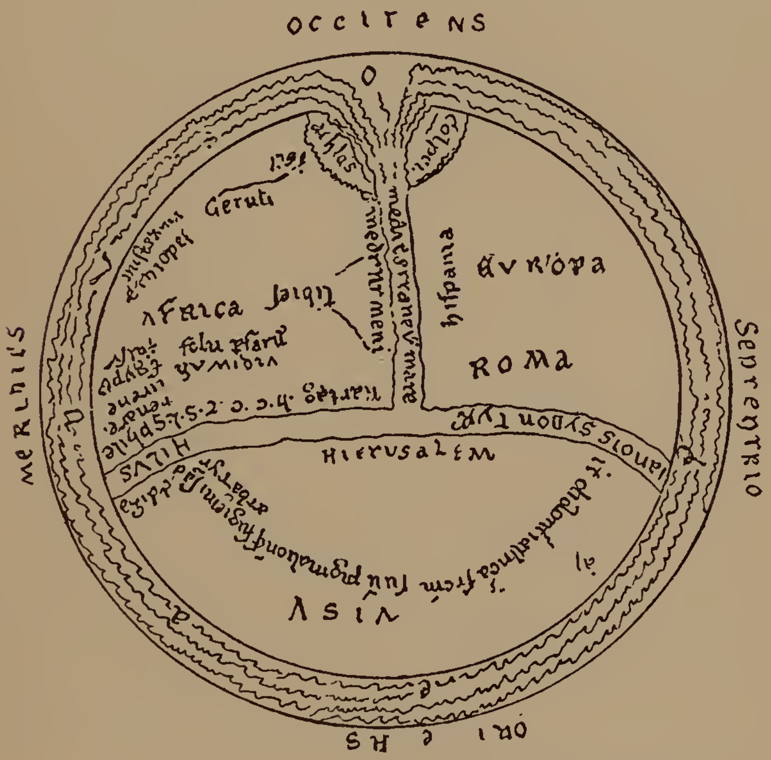
IXth Century



Stanford's Geog¹ Estab¹ London

the countries of the tribes of Dan and Zebulon marked, the classical Pillars of Hercules are actually depicted outside the entrance to the Mediterranean. The sea is encircling the land, but there is a marked improvement in the outline of the land; instead of being straight it is wavy and indented with many arms of the sea, the Caspian Sea being one of them, whilst mountain chains, and large rivers such as the Nile, are inserted. The shape of the British Isles approximates more to the truth, but it is wofully distorted. The whole of Great

A DIAGRAM-MAP. XIIth Century



Stanford's Geog^l Estab^t, London

Britain is drawn out at north and south, so that it holds out towards Ireland arms which have the appearance of great pincers about to grip the 'Isle of Saints' in a last embrace.

The introduction of a little natural history is afforded by an excellent drawing of a lion 'passant' in the north-east corner, with the legend 'Here are many lions.'

A specimen of the circular map is afforded by the 'Psalter map' of the thirteenth century, deriving its title from the fact of its occurring in a Psalter. In treatment it is distinctly Christian; Jerusalem occupies the centre, and on top of the little map—its diameter is only three and a half inches—our Saviour is drawn, with angels on either hand swinging censers, whilst below are two dragons being crushed, though they appear to be about to devour each other!

There is another form of early map, in the nature of diagrams more than anything else, circular in shape, divided from north to south by one or two lines, with an upright line meeting the cross lines, and indicating very roughly the division between Europe, Africa, and Asia, an arrangement which led a poet in 1422 to say, 'A T within an O shows the design.'[1] Two examples of these curious maps are presented in this volume. The first, known as the Strassburg map, is of the ninth century, and it will be seen from this, and the subsequent specimen of the twelfth century, how the division of the world into the three continents is obtained. In the Strassburg map Jerusalem is marked with a cross, whilst names alone suffice to indicate other places. In the second example Asia increases in importance, if we may judge from its size as compared with Europe and Africa; but again, place-names are sparse, Europe contains only 'Roma' and 'Hispania,' and we look in vain for any

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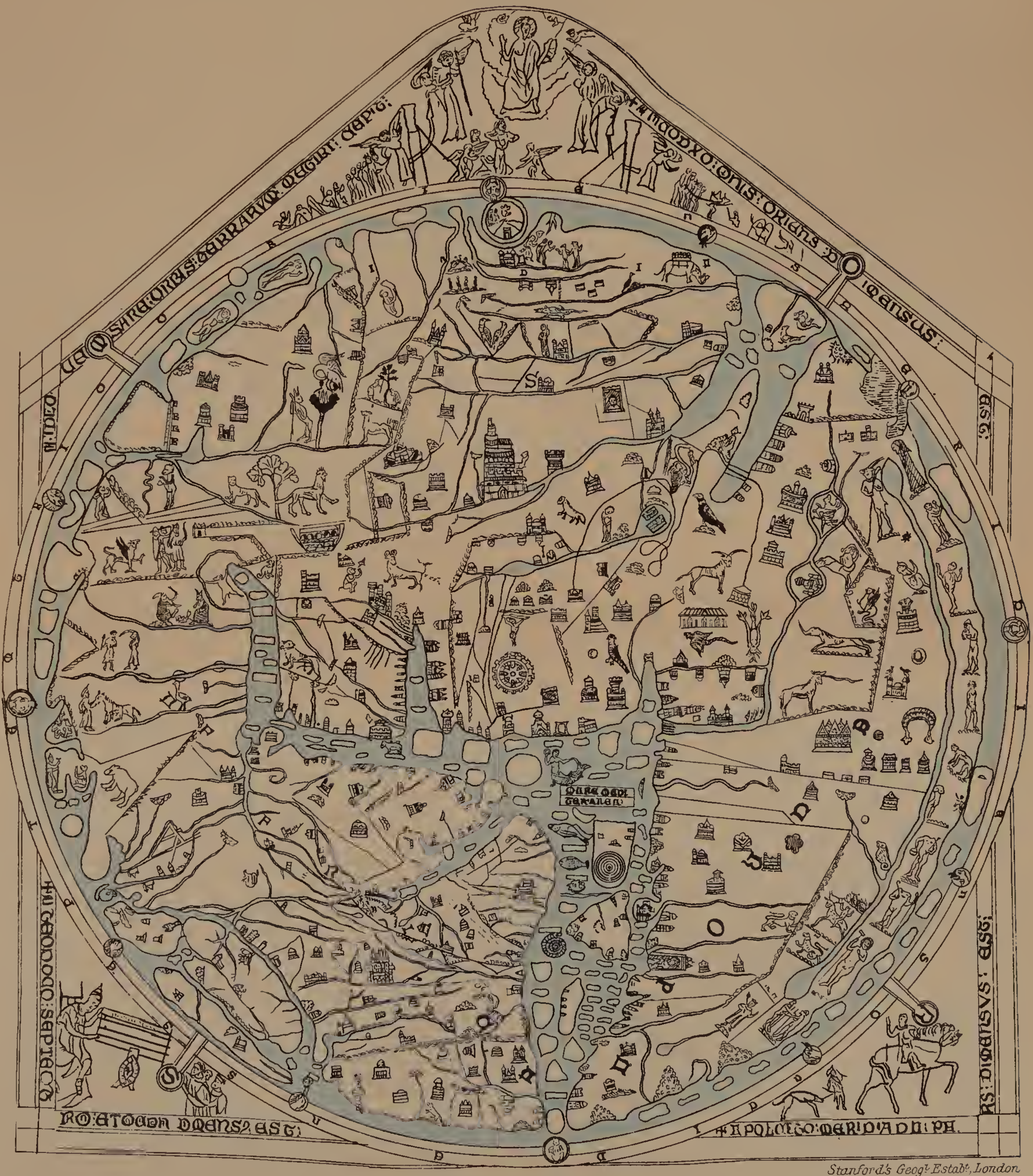
[1] See art. 'Map,' by Prof. Ruge, in *Encycl. Brit.*

Richard of Haldingham's Map of the World, XIIIth Century,
In the Cathedral at Hereford.
generally known as

THE HEREFORD MAP.



Stanford's Geogl. Estabt., London

London: Edward Stanford, 26 & 27, Cockspur St. Charing Cross, S.W.

boundary lines on the continents. Modifications of this idea are found to some extent in the mediæval maps, but the celebrated Hereford mappe-monde, dating from the latter part of the thirteenth century, is drawn more after the style of the Psalter map.

The Hereford mappe-monde preserved in Hereford Cathedral is *par excellence* a specimen of ecclesiastical ideas, and is a most elaborate piece of draughtsmanship. A considerable amount of time and labour must have been expended upon it. The date of its compilation has been assigned to the latter half of the thirteenth century;[1] its author was one Richard of Haldingham. The map has a diameter of 4 ft. 4 in., the vellum on which it is drawn being stretched over an oaken framework.

The geographical knowledge displayed on the planisphere is again curious. The cartographer has laid a variety of authors under contribution, some of whom, Orosius for instance, he specifies. The holy city is placed in the centre, the Terrestrial Paradise is shown at the extreme east (top), and the key of the whole conception is consequently Biblical. Some of its more striking peculiarities are the introduction of the Niger as a great river having no outlet to the sea; streams connecting the Black Sea—a narrow strip of water—with the neighbouring ocean on the north; the Mediterranean liberally supplied with islands, fishes, the legendary Scylla and Charybdis, the labyrinth of Crete, and the Pillars of Hercules. The 'natural history' of the map is also curious: the mermaid, unicorn, and dragon are mixed up with the ape, the whale, and the lion. Stranger still are the marvellous headless men with eyes in their breasts, four-eyed Ethiopians, and other monsters introduced in a series of pictures along the African coast. The British Isles are neatly fitted into a convenient depression in North-Western Europe, and relatively are of considerable size. Even here, where we may suppose the cartographer to have had access to first-hand information had he cared to avail himself of such, we find the countries 'fearfully and wonderfully' drawn. In the first place England and Scotland are almost touching the continent; England is nearly sundered from Scotland; Wales is almost divided from England; whilst Ireland is actually split in twain by a waterway from west to east. From the reproduction on a larger scale of the section containing the British Isles, a better idea will be gained of the treatment of the whole map. The seated figure with the triple crown outside the map erroneously represents Julius Cæsar delivering a written order or warrant to three philosophers to survey the world. The large seal attached to the warrant will be noticed. Below this is an inscription in Norman-French giving the name of the author of the map. The drawing on the opposite lower corner is supposed to represent the author on horseback followed by a forester leading a hunting dog.

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[1] See Bevan and Phillott's *Mediæval Geography*, p. 8.

It has been thought by some writers that there is perceptible in the Hereford map a trace of the Arabic influence,[1] but if any such there be it is certainly hard to find.

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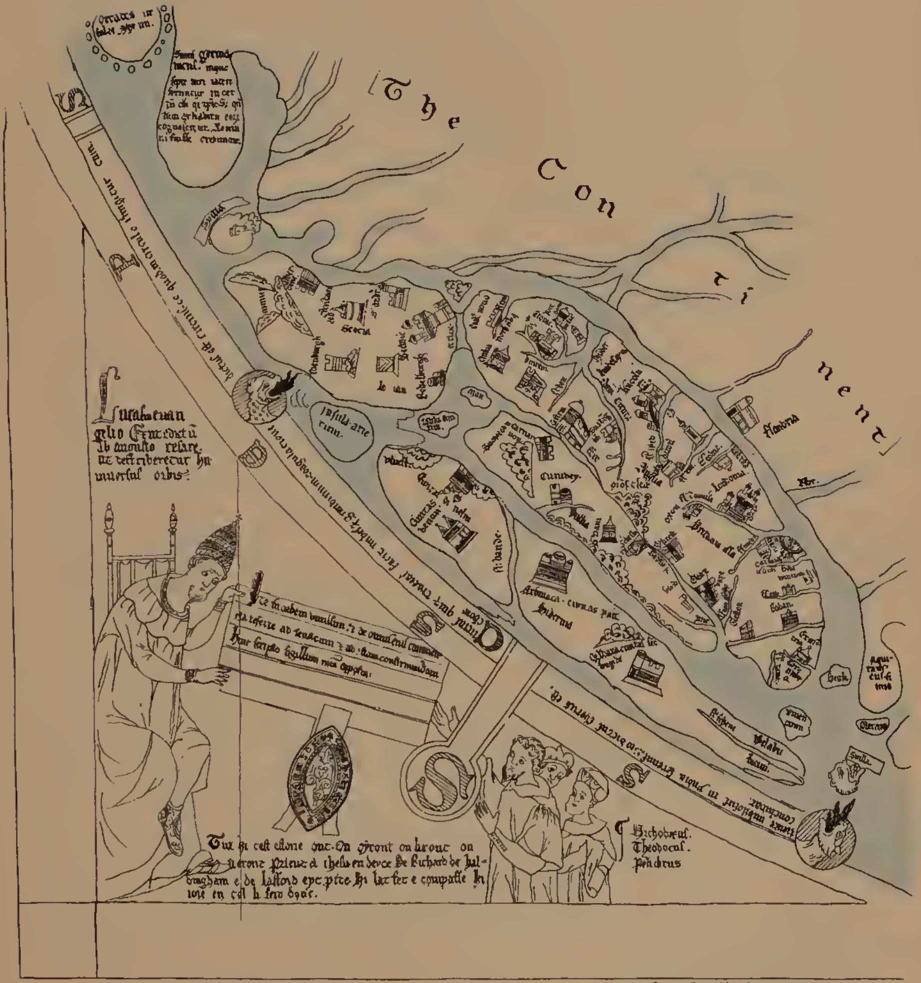
[1] See Wright's *Essays on Archæological Subjects*, vol. ii.

The British Isles from THE HEREFORD MAP.

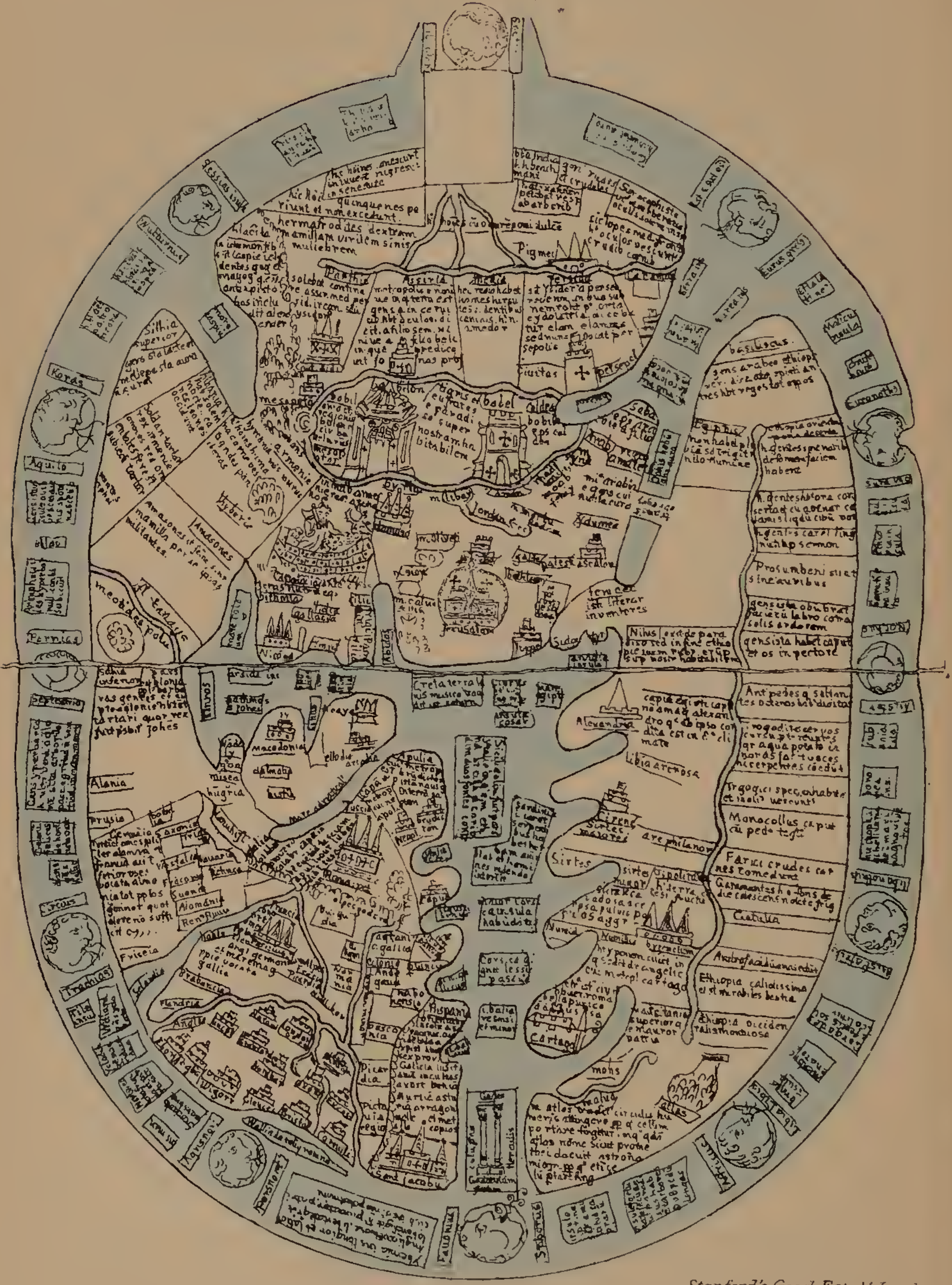

The Continent
Scocia
Insula arietum
Man
Flandria
Hibernia
Armacaca civitas
Cunubey
Britannia
Luca in evangelio. Exiit edictum ab Augusto Cesare ut describeretur huniversus orbis.
Tuz ki cest estoire ont, ou oyront ou liront ou veront, prient a Jhesu en deyte de Richard de Haldingham e de Lafford ke l'at fet e compassé, ki joie en cel li seit donée.
Archobrosus.
Theodocus.
Policlitus

Stanford's Geog^l. Estab^t., London.

London: Edward Stanford, 26 & 27, Cockspur St., Charing Cross, S.W.

A MAP OF THE WORLD, A. D. 1360.

From a MS. of Ranulf Higden.



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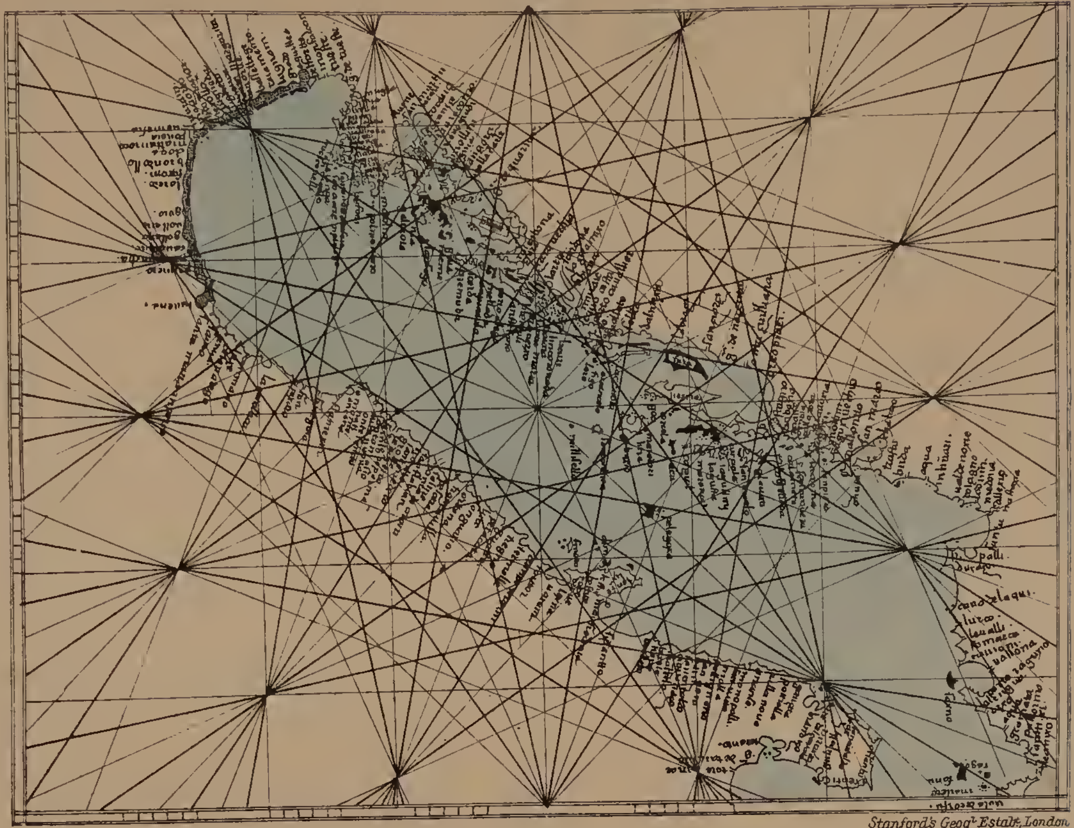
There are three maps in the British Museum drawn a century later than the Hereford map, and again the work of monastic hands, viz., the maps of Ranulf Higden drawn to accompany his work known as the Polychronicon. They bear a great resemblance to Richard of Haldingham's map, though somewhat inferior in style. One of Higden's maps is larger and contains more detail than the two others, and is reproduced herewith. The mappe-monde, it will be seen, is of oval form, and a first glance at its features serves to reveal the astonishing vitality of the old authorities. Geographical writers whose theories, one would suppose, were becoming obsolete with the lapse of centuries are implicitly followed. A few fresh-place names are introduced, but there is no real advance. Norway and Sweden are represented by islands, and Wales has shrunk to a narrow island off the English coast. Jerusalem is given a prominent place by Higden, and its centrality is distinctive; the Pillars of Hercules occupy their old position, and the legends of the Amazons and of the one-eyed Cyclops are retained. In the east three rivers are seen issuing from Paradise. England is occupied with fourteen towns, its only inland features except two rivers, and has the further distinction of being coloured red, probably the earliest example of the kind. In the scheme of coloration the rivers, the seas, and the circumfluent ocean are green, with the exception of the Red Sea, which justifies its name by being painted bright red. Such mountains as are inserted are of a lighter green than that used for the sea.

Yet with all their peculiarities and shortcomings there is one phase, frequently overlooked, but the importance of which cannot be too strongly insisted upon, the fact, namely, of the correct sequence of the countries inserted. Rude and distorted the maps certainly are, with a tendency to keep in a groove, showing a strong family likeness in their essential features ; but they will bear favourable comparison with the attempts at world-portraiture of Arabic scholars, who had worked on the Ptolemaic models. Even the map of Edrisi, the celebrated Arabic geographer, is a poor one by the side of the Hereford mappe-monde.

But side by side with the mappæ-mundi there was springing up a new class of maps, in the form of coast-charts, chiefly of the Mediterranean and Western Europe. They began to make their appearance in the early part of the fourteenth century, and were designed solely for the use of mariners and pilots. Coast-lines were carefully drawn from actual sailing reports, and all the different ports were carefully inserted ; hence they were known as 'portolani.' There is no doubt that they had their origin with the maritime people of Southern Europe, and as they aimed at nothing more than a simple sailing guide, they were singularly free from error. No legends or monsters found a place on the portolani, so that from the first they were free from any preconceived notions, and were corrected and improved as time went on, in particular when the use of the compass came to the mariner's aid.

It will be seen that they were different from the peripli of the old Roman traders, which had been merely written directions for coasting, and were unaccompanied

A PORTOLANO, 1384.
(Adriatic Sea)



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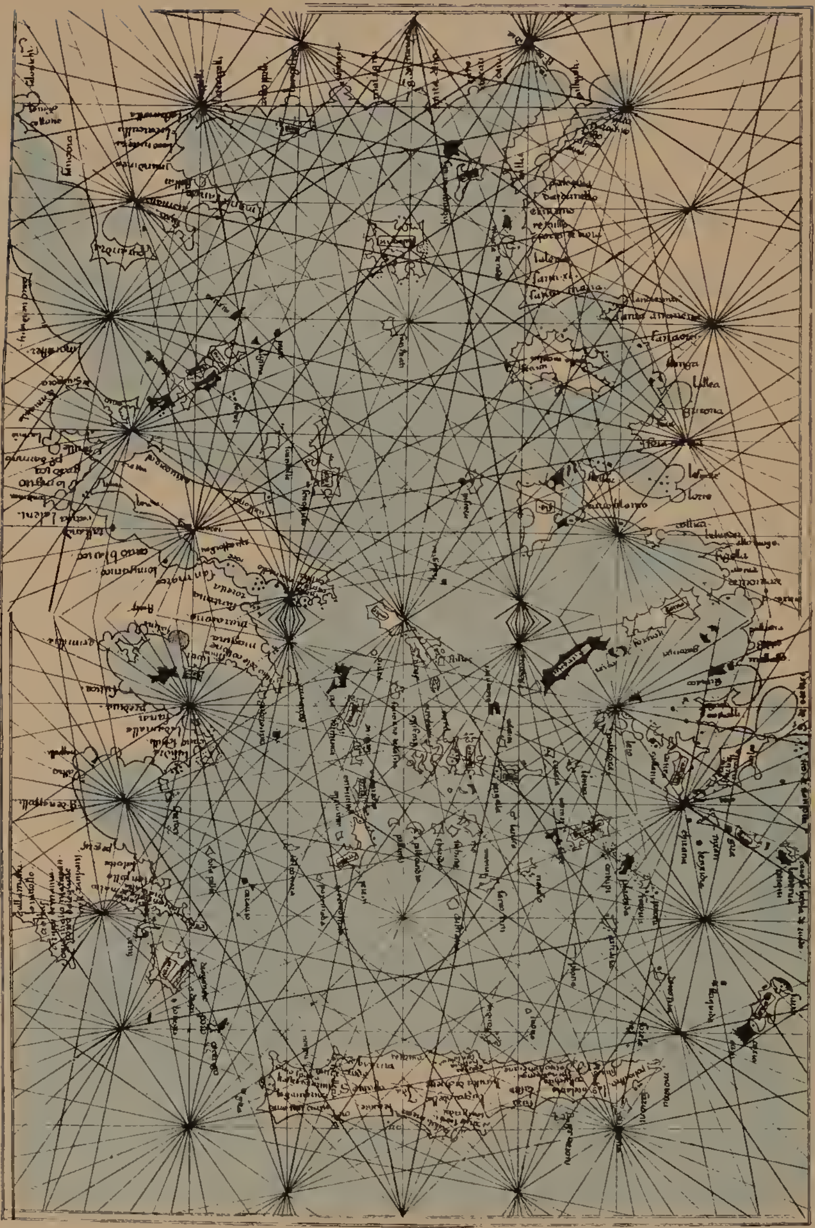
A PORTOLANO, 1384.

(Aegaean Sea)



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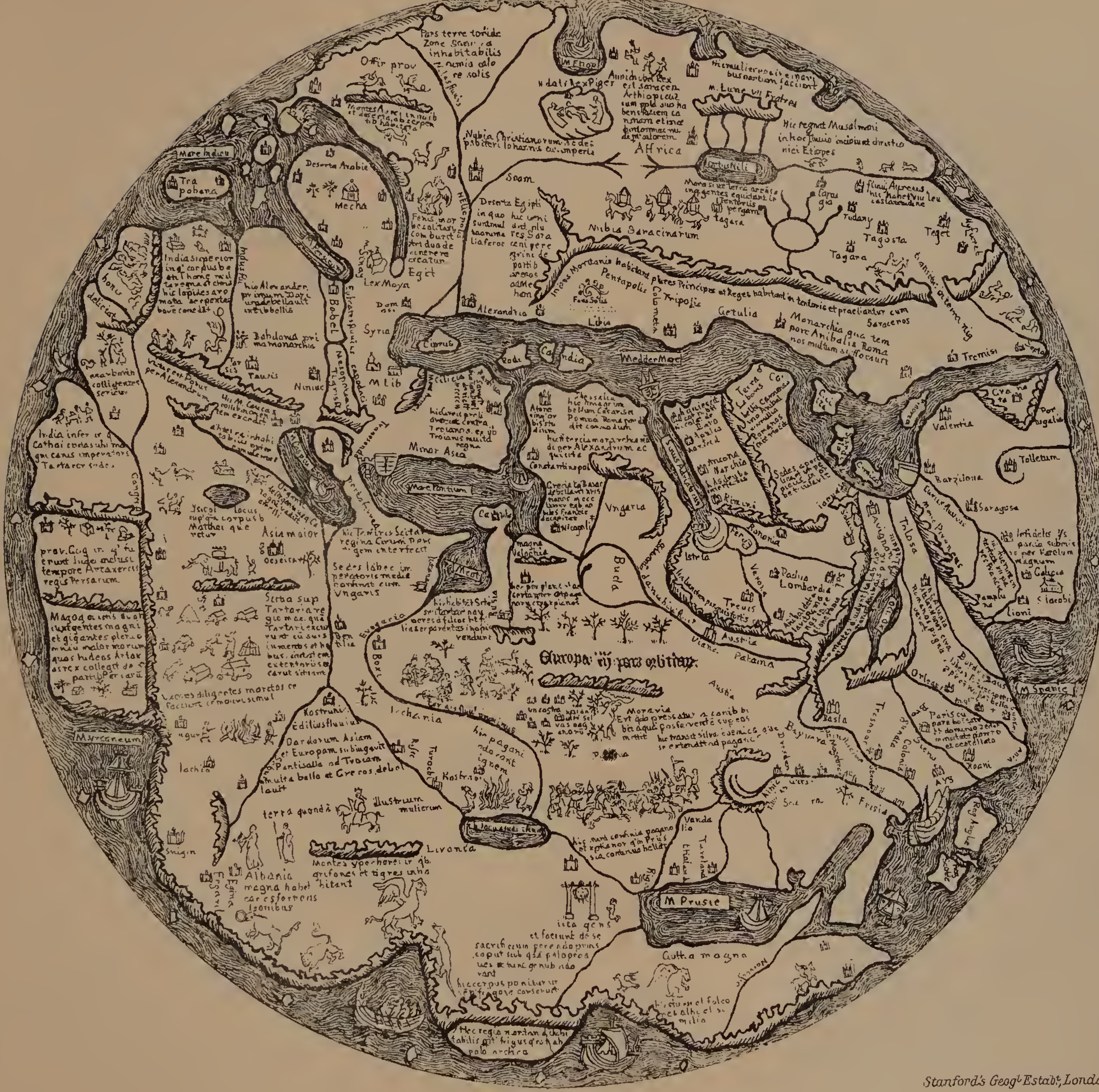
by charts. The portolani were also quite distinct from the mappæ-mundi, and present a striking contrast in their sober treatment of geographical information to the latter, which added to the terrors of the known world by depicting all kinds of uncouth and formidable monsters in the unknown regions. Indeed one of Prince Henry's earliest difficulties was in connection with the superstitions entertained by his sailors; it proved a real hindrance to his work for some time. And some, at least, of these wilder notions may be ascribed to the mappæ-mundi. When the portolani began to be applied to drawing the map of the world, as they were after a time, the gain to the mappe-monde was naturally valuable; and although the older type of unscientific mappe-monde continued to be drawn at a much later date—the Borgian map of the fifteenth century is an example—the maps tended generally to improve. And from a perfect specimen of portolano, such as Dulcert's of 1339, we come to the combination of both portolano and mappe-monde as in the celebrated Fra Mauro map, of which we shall have more to say hereafter, since it marks the advance of geographical knowledge under Henry the Navigator.

And lastly, to give a final example of purely unscientific map drawing, we may take that known as the Borgian map from having been at one time in the possession of Cardinal Borgia. The original is engraved on bronze, and dates from the early or middle part of the fifteenth century, and although we miss many of the old characteristics drawn from classical and patristic sources with which the earlier examples have made us familiar, yet it forms a striking commentary on the wide divergence between unscientific work and the practical results obtained by mariners and pilots who perforce had adopted a rational method of map construction.

Having thus briefly considered the main features of mediæval cartography, there remain two other maps that have a special bearing upon our subject. They are known respectively as the Laurentian portolano of 1351, preserved in Florence, and the Andrea Bianco map of 1436. The former shows Africa unmistakably surrounded by water ; and though this had been indicated on the Marino Sanuto map of forty-five years earlier, the Laurentian portolano is more strikingly suggestive of the possibility of circumnavigating Africa. Whether it was the result of a bold guess or not remains doubtful.[1] The Venetian map of Bianco, on the other hand, contains a large island to the west of the Canaries marked Antilia, and whether this is the old legend of Plato revived, or is the result of a genuine discovery, is again perplexingly doubtful. At any rate the name survived, as we shall see, and Cuba, discovered by Columbus, remains to this day the ‘Queen of the Antilles.’

[1] See Beazley's *Henry the Navigator*, p. 118.

THE BORGIAN MAP, A. D. 1452.



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CHAPTER V

HENRY THE NAVIGATOR

THE threads and links of our story, gathered up from many sources, have been gradually drawing together like the affluents of a great river hurrying towards the ocean. We have paddled down this river, as it were, passing with it through many countries and strange places; the time has come when we must abandon our smaller craft for a stouter one—we are about to embark on the ocean, to learn what it has in store for us.

Great overland trade routes, or old Roman roads, will no longer be our main interest. Our affections will be transferred from land to sea. The old Norse spirit will find its ultimate outlet, and the old Viking qualities will be in demand.

The entrance of Prince Henry is heralded by the clash of arms. He was born at Oporto on March 4, 1394, and had just come of age in 1415 when he won his spurs at the siege of Ceuta, a town of Morocco near the Straits of Gibraltar. It was a triumph of Christendom over Islam, and it shows how Western Europe was already beginning to throw off the yoke of Mohammedan supremacy.

For his share in the day's work Prince Henry was rewarded by knighthood, and his reputation as a soldier was so firmly established that he was made governor of the newly acquired town. But the Prince had other and larger aims. He had been seized with the idea of lighting up the fearful obscurity of the ocean. It is said that he gleaned much valuable information from the Moors at Ceuta, of inland Africa, and of the trade carried on with the interior; and certainly if he succeeded in getting any information at all from the Moors he may have learnt something of the distant coasts of Guinea, if not beyond. At any rate, he did not long remain at Ceuta. As soon as possible he got away from there and established himself at the little town of Sagres near the extreme point of Cape St. Vincent. Here he built a residence, together with a chapel and an observatory, and hard by, in the port of Lagos, he commenced to build his caravels. The making of maps and their correction and improvement were diligently prosecuted; and his men were instructed in navigation by mariners and mathematicians, whom he invited to his little court.

Now the situation chosen by Dom Henry is typical of the situation of Portugal itself, and is of the first importance in this connection, since from its very position at the western extremity of Europe—nay, at the extremity of the world of those Middle Ages—Portugal was eminently the country of all others to expand the knowledge of the world. Hemmed in by a powerful neighbour on the land side, the ocean washing its long seaboard offered the only means of expansion.

True, the other maritime countries of South Europe—Italy and Spain—had already made ventures in the same field. Catalans had sailed down the African coast as far as Cape Bojador, fifty years before Prince Henry was born ; but work in this direction was not followed up, and nothing seems to have come of it. Other vessels sent out to the Atlantic were never heard of again, and the Portuguese had to begin *de novo*. The man had arisen, in the person of Dom Henry, who was to begin this expansion in real earnest, and raise his country to the highest pitch of maritime power.

HENRY THE NAVIGATOR

In a little more than three years from the memorable fight at Ceuta, the Prince's ships discovered the island of Porto Santo and shortly afterwards Madeira. The romantic story of the accidental discovery of Madeira by an Englishman in 1370 or thereabouts is not without its interest to us, and moreover it is said that Prince Henry derived his knowledge of the existence of Madeira from the adventures of the hapless Englishman.

In the reign of Edward III. one Robert Machin is supposed to have eloped from Bristol with a very beautiful lady, Anne d'Arfet. The boat in which they were flying to France was driven by storms out of its course until it finally reached Madeira, where the lady died of fright and exhaustion, her lover dying of grief a few days afterwards. The survivors sailed away, were wrecked on the African coast, and thrown into a Moorish prison, where they told the story of their adventures to a Spanish pilot, Juan de Morales, who was subsequently ransomed and served under Henry the Navigator. Morales related the story he had heard, and was sent out with Tristam Vaz to find—and did find—the place described. It is also said that the Portuguese found the wooden cross which Machin's companions had set up to mark the grave of the lovers.[1]

Year after year the indefatigable Prince despatched his little vessels on their journeys, urging the captains and sailors to penetrate farther and farther in the southern seas, giving them new charts and better compasses, improving the astrolabe to the requirements of navigation, and animating all his men with his enthusiasm.

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[1] The town of Machico is said to derive its name from Machin. A little chapel on the shore, built to mark the spot where the lovers landed, was completely washed away during a storm in October 1803.

The formidable Cape Nun, and in 1434 the more dangerous Cape Bojador, were doubled by Gil Eannes, and in 1441 Nuno Tristam sailed for twenty-five miles beyond Cape Blanco. Slowly but surely the torrid zone was being penetrated, the story of the insupportable heat was gradually giving place to a more rational one as it became more and more apparent that it was possible to live in those regions. And now, for the first time almost, Portugal began to awake to the importance of the new enterprise. Tristam's voyage had been a profitable one in every way, and those who had grumbled at the waste of money, and laughed at the work of the Prince, were now becoming anxious to share in that work, or rather to share in the profits. 1441

It was during this voyage that Tristam discovered the small island in the Bay of Arguin just beyond Cape Blanco, and so important did its position appear to Prince Henry that he directed a fort to be erected there, in order to facilitate and protect the regular trade which he foresaw would soon be established. Four years later his plan was put into operation, and the foundations were laid of the first Portuguese fort in Africa.

It showed how accurate was the perception of the Prince as to the value of this 'naval station,' when in after years English, French, and Dutch strove with the Portuguese for its possession.

Early in 1444 a fleet of six caravels set out for the new coasts, some merchants having obtained a licence and helped to fit out the fleet, being now only too willing to help to send ships where gold and slaves were to be had. The bearing of this commercial side to the exploring expeditions of the Prince's lieutenants is of the utmost importance. It was valuable during Prince Henry's own time, and it served as a stimulus to fresh discovery after his death.[1] Of the high and pure motives of the prime mover in these voyages it is beyond all question true that the Prince did not aim at making slaves, but rather at making converts to Christianity. His avowed objects were to organise discovery, to extend in importance and wealth his own Portugal, and at the same time to convert the heathen and spread Christianity, so that when captives were brought home he regarded them as so many souls saved from the outer darkness. It is equally true, however, that, with one or two exceptions, Henry's scientific zeal and love of exploration for its own sake found no response in those who commanded and manned his caravels. Love of gain was the magic wand that drew them on and on, into unknown leagues of waters, and into wild adventures and desperate affrays with Arab and negro.

In March of 1455 a Venetian named Alvise Cadamosto sailed under the auspices of Prince Henry, and, touching at all the newly discovered islands, sailed as far as the Gambia. The following year he made a second voyage, came upon some of the Cape Verde Islands, and sailed to within eleven degrees of the equator. Thus was reward gradually accumulating.

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[1] See Beazley, *Henry the Navigator*.

In spite of political troubles, which distracted him at intervals from his quiet work on the 'inhospitable point of Sagres,' Henry continued that work with good result. In 1458 he determined on a longer voyage. He 1458 equipped three caravels, and giving the command to Diego Gomez bade him push on as far south as he could. The vessels sailed as far as the Gambia, and Gomez ascended the river for a considerable distance, entering into friendly intercourse with the natives, learning much of the richness of the country, and carrying back to Portugal a valuable cargo.

It was the last voyage planned by Henry the Navigator. He died on the 13th of November, 1460, and therefore did not live to see the final triumph of his undertakings.

To us it may seem meagre to survey the actual extent of African coast-line which had been explored when the hand of Death removed Dom Henry from his labours.

Before he died, the Canary Islands, Madeira, and the Azores had become Portuguese colonies under his care, yet his captains had not advanced so far south as the equator, though the distance actually covered was considerable, being close on two thousand miles, and a fairly accurate knowledge had been obtained of the African coastlands and their valuable products.

The fame of Prince Henry does not rest upon these results; it does rest upon the impetus given to exploration by his lifelong devotion, which made it a comparatively easy task after his death to carry on the work he had so well begun. The idea of long voyages was 'in the air,' and had been divested of terror. Sailors would now venture away from land who had formerly declared that the hand of Satan waited to snatch up any who attempted to penetrate the 'Sea of Darkness.'

Englishmen, too, may be proud of Henry the Navigator; his mother was Philippa, daughter of 'old John of Gaunt, time-honoured Lancaster,' and he was therefore half an Englishman. Moreover, there is something singularly attractive in the personality of Prince Henry; his influence was that of mind over matter. From his wave-washed home he inspired the courage of his men and planned their voyages, and by the purity of his actions and devotion of his life really lived up to his inspiring motto 'Talent de bien faire.'

For some years after Prince Henry's death nothing seems to have been attempted in furtherance of his
1469 plans, but in the year 1469 one Fernando Gomez undertook to extend the exploration of the African coast-line for 500 leagues southward, in return for certain trading privileges granted to him by the king Affonso V., and it would seem that some further discovery was made.

In 1484 Diego Cam reached the Congo, and in a subsequent voyage in 1485 sailed some two hundred leagues
1486 beyond this. In 1486 a land expedition was despatched, under Covilham, to find a new land route to India; whilst at the same time Bartolomeo Diaz was given the command of three vessels to continue the discoveries by sea. Three years later Diaz returned to Portugal with news of the finding of the Southern Cape. He related how he had passed down the African coast beyond the

furthest point already reached by Portuguese ships, and had then sailed off due south until storms had driven him to the east. The crew had at length murmured, provisions were almost exhausted, and reluctantly then he turned back, to be rewarded by finding the very cape he had been searching for. Diaz named it El Cabo Tormentoso, or the Cape of Storms; but the King feared that such a name might deter others from approaching the place, and he therefore changed it to Cabo de boa Esperança, or Cape of Good Hope, a name which it has ever since retained.

The bravery and enterprise of Portuguese sailors do not end with this discovery by Diaz of the Cape of Good Hope; but although the possibility of reaching India and the East—the goal of European desire—had been established by the rounding of Africa, yet for more than ten years no attempt was made to profit by the discovery, and the voyage of da Gama to India by this route was subsequent in time to the discovery of America by Columbus.

An important and justly celebrated mappe-monde of this period fittingly marks the close of the geographical era of Henry the Navigator—namely, the Fra Mauro map to which we have already referred. It was commenced in 1457, and is said to have occupied three years in construction, at the Camaldolese monastery of St. Michael di Murano, near Venice. There is a copy of the map in the British Museum: the original is still preserved at Venice. It is a large map, measuring more than 6 feet across, and, apart from the mass of detail with which the whole is covered, it shows the African coast in a way it had never been shown before, since it embodies all the discoveries that had been made in this direction down to the time of Henry's death. More than this, it forms a striking proof of the great impetus which Henry's life-work had given to the cartographer's art as well as to navigation and discovery. It was the application of science to map drawing, since it combined the good qualities of the portolano with the best features of the old mappe-monde.

CHAPTER VI

AIDS TO GEOGRAPHICAL EXPANSION

NO sketch of the history of geography would be complete without a glance, however brief, at the instruments which helped the mediæval explorers to undertake and prosecute their work of geographical expansion. And however rude those instruments may appear to us, they are, nevertheless, the forerunners of our modern sextants, quadrants, Kew-tested chronometers, and Admiralty charts. Moreover, when we consider that mariners in the early days of pioneer voyages had nothing better to help them, we cannot help being struck with admiration, both of the instruments and of those who used them.

We have seen that the work of Dom Henry was essentially maritime, and, since the great discoveries that followed were all made by the paths of the sea, it will be interesting to learn what instruments mediæval mariners possessed to help them in their work. Henry himself had directed his attention to the improvement of nautical instruments, and it will be fitting to consider them now before we pass to the work of his successors. It will help us to realise better the meaning of a sea voyage such as that undertaken by Columbus.

First, let us deal with the compass, most indispensable of nautical instruments.

Like the other old geographical instruments, the origin of the mariner's compass is shrouded in obscurity.

There can be no doubt that in a crude and simple form the compass was in use, in the Far East, at a very early date. Indeed, its invention has been claimed by more than one eastern nation, the Chinese in particular laying claim to an early knowledge of the properties of a magnet and its application to purposes of navigation in the form known as the water-compass—*i.e.* a magnetised needle resting on a splinter of wood floating in a dish of water. Its eastern origin seems clear, since there is no authentic record of its use in European waters until the middle of the thirteenth century, and the earliest known European reference to the compass is that contained in the treatise 'De Utensilibus,' and again in 'De Naturis Rerum,' by the English monk Alexander Neckam, of the twelfth century. 'Mariners at sea,' says Neckam in the latter treatise, 'when through cloudy weather in the day which hides the sun, or through the darkness of the night, they lose the knowledge of the quarter of the world to which they are sailing, touch a needle with the magnet, which will turn round till, on its motion ceasing, its point will be directed towards the north.'

We get another definite allusion to the compass in the 'Bible Guiot de Provins,' a satire written about the year 1190. Guiot de Provins had no doubt been shown a compass during his stay in the East with the Crusaders. At all events, the Dominican Vincent de

Beauvais, the Middle Age encyclopædist, writing nearly fifty years later, speaks of the compass as a great curiosity that had been seen in the East. The Cardinal Jacques de Vitri, one of the historians of the Crusades, writing about 1218, makes a more definite statement, for he tells us that the magnetic needle was in use in the East for purposes of navigation when the Franks first went to Syria.

THE ASTROLABE

There is no doubt that by the beginning of the fifteenth century the compass had been improved and fitted into a box, though when this happened and who thought of doing it are unknown, and the compass therefore came as a useful legacy to Henry of Portugal when he commenced his maritime ventures. More than one maritime city of Southern Europe—Amalfi in particular—has contended for the honour of having given seamen an improved compass, but it seems best to regard it as common to the Mediterranean countries, and to have attained to a high degree of perfection before the close of the crusading era.

But whilst the compass was essential to a voyage of any length, it was not the only instrument needed to navigate a vessel. It was necessary that the ship's position should be determined, and this was done roughly by means of the astrolabe.

Of the origin of this instrument there has been more than one account, and myth has not been wanting to supply the want of actual knowledge. The astrolabe is said to have been known to Hipparchus and to Ptolemy, either of whom may have derived it from older sources—Egyptian, Assyrian, or Chaldean. But it became essentially an Arabic instrument for astronomical purposes, and we may trace its introduction into Spain during the time of the Mohammedan supremacy, and it was in general use in Europe by the beginning of the fourteenth century.

Of its early use among the Arabs and Persians, and generally in the East, there is ample evidence. As Professor Skeat points out, there is at least one treatise on the astrolabe—the 'Compositio et Operatio Astrolabie,' written by Messahala, an Arabian astronomer, in the eighth century.

In the 'Arabian Nights,' the stories of which were floating about the East for centuries before they condensed into the form in which we know them, is contained a reference to the same instrument. In the 'Story told by the Tailor' there occurs the following:

'. . . instead of putting water into the basin, he (the barber) took a very handsome astrolabe out of his case, and went very gravely out of my room to the middle of the yard, to take the height of the sun.'

The use to which the barber put his 'handsome astrolabe' was for the purpose of ascertaining if the day were a propitious one for shaving the head of his customer; and no doubt the astrolabe held an important place in the study of the astrologer, but this in no wise detracts from its real value to genuine astronomical and geographical research.

At Pekin there still exist astronomical instruments which date back to the time of the Mongolian rulers, and we read of Hulagu, brother of Mangu Khan, that when he had stormed and taken the ancient city of Baghdad—with the usual Mongolian ferocity, be it said—in February 1263, his astronomer, Násir al-din, obtained permission to erect an observatory at Maragha, near Baghdad, and that it was 'well furnished with armillary spheres and astrolabes, and with a beautifully executed terrestrial globe showing the five climates.' And this was nearly two hundred years before the first maritime ventures of Western Europe under Henry the Navigator.

An early notice of the astrolabe was made by Venerable Bede in 720, and besides the Arabic treatises, with which we are not concerned, there have been several European descriptions.

Chaucer, in 1391, wrote a treatise on the astrolabe for the use of his son Lewis, then ten years of age. It was written to answer questions that Lewis had put to him ; to us it is valuable as affording an insight into the geographical views held by an intelligent Englishman in the fourteenth century.

'Little Lewis my son,' begins Chaucer, 'I perceive that thou wouldst learn the Conclusions of the Astrolabie ; wherefore I have given thee an instrument constructed for the latitude of Oxford, and purpose to teach thee *some* of these conclusions. I say some, for three reasons ; (1) because some of them are unknown in this land ; (2) because some are uncertain ; or else (3) are too hard. This treatise, divided into five parts, I write for thee in English, just as Greeks, Arabians, Jews, and Romans were accustomed to write such things in their own tongue. I pray all to excuse my shortcomings ; and thou, Lewis, shouldst thank me if I teach thee as much in English as most common treatises can do in Latin. I have done no more than compile from old writers on the subject, and I have translated it into English solely for thine instruction ; and with this sword shall I slay envy.'[1] And so on, 'simply and tenderly—true to the pure domestic feeling that shines through his verse,' as Professor Henry Morley says.

Chaucer's reference to the old writers from whom he

[1] Skeat : Chaucer Society's edition.

had compiled is interesting, as showing that their works were still in request among scholars, and formed the groundwork of geographical knowledge in his day; and again is sure evidence that the astrolabe which the 'Father of English Poetry' described was a very old instrument.

It was made usually of iron or copper, but other metals were used, such as tin and brass; its shape was always circular, and its weight was sufficient to render it steady during use, when the observer held it by a ring on his thumb before him. Degrees were marked round the edge, and a movable pointer with sights was fastened to the centre of the plate. When the instrument was suspended, the pointer was directed by hand to the object under observation so that it could be seen through both sights, and the angle was thus indicated.

Besides the metal astrolabes we have mentioned, there were others, larger in size and constructed of wood, which appear to have been used by the Portuguese when they first took to making ocean voyages away from land, instead of coasting as they had done in the time of Henry the Navigator. From John de Barros, one of the historians of the Portuguese, we learn that when Vasco da Gama set out from Lisbon on his famous voyage in 1497 he carried on board, amongst other articles, a 'great wooden astrolabe.'

'They used chiefly,' says Barros, 'an astrolabe of wood of three spans diameter, which they mounted on three poles, in the manner of shears, the better to make sure of and ascertain the solar time, and they were able distinctly to know the true altitude of that spot, since they carried with them other small ones of brass, so rudely did this art commence which has given such results to navigation.'[1] One of these large wooden instruments, of 6 feet radius, was erected in London in 1594. According to another historian, Gaspar Correa, rules or tables of the sun's declination for use with the astrolabe were made by Abraham Zacut, a Jew of Lisbon, in the year 1502; but Correa may not be trustworthy on this point, since he did not write his 'Lendas da India' until 1561, and therefore he speaks from report only. His description of Zacut's astrolabe is delightful. 'It was of copper of the thickness of half a finger, round, with a ring in which it was suspended straight, and upon it lines and points, also of copper, sliding round the circumference, and in it were placed some holes placed opposite one another, so that the sun entering through both at the moment of midday, it was seen in what part was the sun; all this with great art and subtle method: and he named it astrolabe, for taking thus the exact spot in which the sun was, and making a reckoning in the table of each year, it was known how many leagues had been gone. This the Jew taught to some pilots whom the King sent to him, how and in what manner they were to take the sun at the moment of midday with the astrolabe, and teaching them the reckoning they had to make with the tables of the rules, in all which he indoctrinated them much.'

Correa also credits Zacut with devising another

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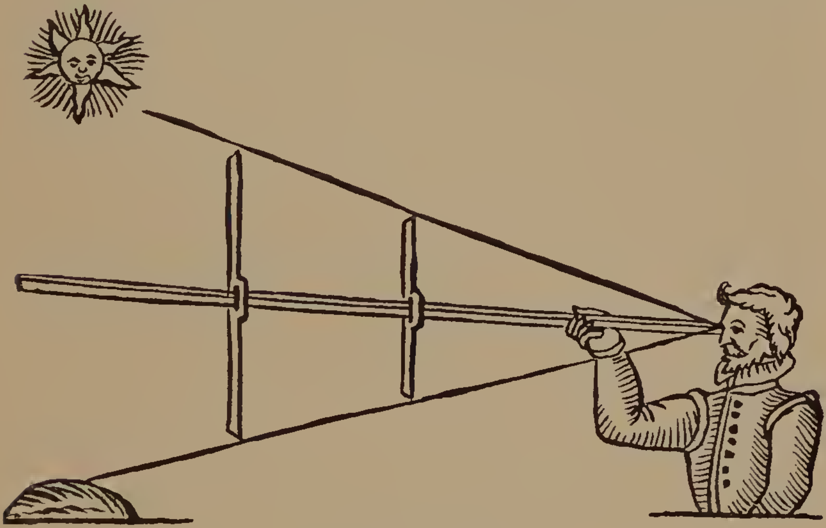
[1] *The Three Voyages of Vasco da Gama*, edited by Lord Stanley of Alderley (Hakluyt Society).

'greater contrivance' for taking the altitude of the pole star. But the patriotism of the historian leads him to ascribe too much to his countrymen, since the tables of which he speaks were in use long before Zacut was born. Zacut may have improved and corrected them from fresh observations.

In 1484 the cosmographer Martin Behaim, whose famous globe we shall have occasion to notice hereafter, modified the older form of astrolabe, making it easier to use at sea, and it was doubtless this modified form that Columbus used.[1]



THE CROSS-STAFF

Another old instrument of navigation was the 'cross-staff.' It was constructed of two light pieces of wood, on the longer of which a scale of degrees was marked. The cross piece fitted closely over the 'staff' at right angles and had a length of 26 inches. Pinules, or sights, were fixed at the ends of the 'cross' as well as at one end of the 'staff.' The cross-staff was improved from time to time by adding two or three transverse pieces to suit different altitudes, and at the end of the sixteenth century a 'back-staff' appears to have come into use, deriving its name from the observer standing with his back towards the sun when making an observation. It was thus unlike the cross-staff or 'fore-staff,' in using which the face of the observer was turned towards the stars under observation. They were all worked by sliding the cross piece towards or away from the eye until the sun or star could be seen by the top pinule and the horizon by the lower one simultaneously. The degrees and minutes cut by the inner edge of the cross upon the side of the staff graduated to the cross in use gave the altitude of the sun or star.

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[1] Winsor's *History of America*, vol. ii.

The other instruments that found a place on shipboard were the hour-glass, minute-glass, sundial, and log. The latter consisted of a small piece of wood, usually triangular in shape, about a quarter of an inch thick, and made to float upright by means of a piece of lead fastened to it. The log line was attached to the log, and had knots on it at certain intervals. The log was thrown overboard and the 'knots' counted as the line ran out for the space of half a minute as indicated by the time glass.

It is not clear at what date the log came into use, but it affords an easy means of estimating roughly the speed of a ship, and consequently of finding roughly the longitude. There is a record of its use in Magellan's vessels on the voyage of 1518–20. Pigafetta, the historian of the voyage, says: 'According to the measure we made of the voyage, by means of the chain at the poop, we ran sixty or seventy leagues a day.'[1] It was the prototype of the modern self-indicating log.

Such, then, were the instruments that the mediæval mariners possessed. They carried also charts, sometimes of extreme accuracy, like the portolani, but the utility of these was at an end once the vessel was taken into new waters. And this simple equipment remained practically unaltered almost down to the present century.

In the year 1594 we find John Davis, the English navigator, in his little book 'The Seaman's Secrets,' giving a list of instruments necessary for a voyage, including 'the sea-compass, cross-staff, chart, quadrant, astrolabe,' &c., so that although an early form of quadrant had come into use it had not yet superseded the older instruments. Later still, in 1659, we find it stated by Moxon, the hydrographer to Charles II., in his 'Tutor to Astronomie and Geographie,' that 'there are divers instruments whereby Altitudes may be taken; but the *most in use* are the Quadrant, Astrolabe, and Cross-staff.'

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[1] Guillemard, *Life of Magellan.*

CHAPTER VII

COLUMBUS AND THE NEW WORLD

FROM the scion of the royal house of Portugal, in the person of the Infant Dom Henry, we pass to one whose origin was of the humblest. Born at Genoa in 1435 or thereabout, Christopher Columbus was consequently a young man when Prince Henry died. His father is said to have been a wool-comber, and there is no doubt his parents were obscure toilers, for in after years, when Fernando Columbus wrote the life of his father, he inquired into his descent and came to the conclusion that ample honour was to be derived from the great admiral his father without troubling any of his other ancestors to contribute to the glory of the family name. 'I am of opinion,' says Fernando, 'that I should derive less dignity from any nobility of ancestry than from being the son of such a father.'

With the discoveries of the Portuguese Columbus was, of course, well acquainted, and, in a sense, he is to be regarded as the disciple of Prince Henry; for although Columbus himself was disposed to think that a divine Providence had prompted him to undertake his voyage across the Atlantic, we cannot doubt that the great exploring activity set on foot by Henry the Navigator

CHRISTOPH COLOMBO LIGUR
EXCOGITAVIT ET PRIMUS
ET M
FAMA SAT

COLUMBUS

was really the guiding force. Columbus, however, was the man in whom that activity found its best exponent, and, whether he were the product of his age or not, he stands as the central figure of the most momentous discovery in the history of the human race.

The visions of the magnificence of the East, the splendour of Cathay, its richness as recounted by travellers like Marco Polo, the ancient and valuable trade with India, were all objects to tempt the Portuguese, and were the most difficult of access to Portugal, since to reach them the whole of Europe and Asia had to be traversed. It is easy to imagine how the value of a sea route must have been the subject of endless discussion, and must of necessity have stimulated all men's thoughts. How much must they have warmed the bold genius of Columbus!

And first, to recapitulate, how far had men advanced in their ideas? How far had the efforts of Henry the Navigator led his countrymen? In the first place the equator had been crossed, the torrid zone had been penetrated, and the old fables of its intolerable heat had been for ever laid to rest. The voyage and discovery of Diaz had for ever cleared up the mystery of the southern ocean. The tradition of the circumnavigation of the African continent centuries back in the dim ages of the Pharaohs was found to have been at least a possibility. The Ptolemaic theory of a great extension of Africa to the east below the equator had been dispelled, and Portugal had only to send properly equipped vessels to make the sea voyage to India. At the same time it was clear that the journey was a long one, and

Columbus became convinced that the distant eastern regions could be reached by sailing westwards. How did he come to entertain this idea? We know that by the year 1474 he had set his mind on this western route, since he expressed the intention to his friend Paulo Toscanelli, a Florentine cosmographer, when writing to him at this time, and he may in all probability have thought it feasible long before then. To begin with, he was an experienced seaman, and had already made several long voyages; but, more than this, he was well read. He had turned to all the old authorities, Ptolemy and the rest, as well as the writings of the Fathers. All the theories of the ancients were tested in the light of the recent discoveries, and every scrap of information tending to confirm his belief was carefully examined and retained. Various stories were told him by sailors, of strange pieces of wood and large reeds having been picked up at outlying places like the Azores and the Canaries. All these items he pieced together, and they served to confirm the idea he had so long cherished. But we have a more valuable indication of the state of geographical knowledge in the celebrated globe made in 1492, the year of Columbus's first voyage of discovery, by Martin Behaim for his native city of Nuremberg, where it is still preserved. The globe (drawn on vellum, and stretched over a framework) embodied all the latest and most reliable information, and was considered an excellent piece of workmanship. Looking at the world as drawn on Behaim's globe—which without doubt represented the actual views of Columbus—the possibility of a passage across the Atlantic from Europe to Asia looks simplicity itself, for the Azores and Cape Verde Islands appear as not more than 80° distant from the large island of Cipangu (Japan), and Columbus reckoned the distance at about a third of the circumference of the globe. 'It is singular,' says one of his biographers, 'how much the success of this great enterprise depended upon two happy errors—the imaginary extent of Asia to the east, and the supposed smallness of the earth.'[1]

The story of how Columbus laid his matured plans before John II. of Portugal, and the referring of the proposals to a council where they were treated with scorn, is too long for our present purpose. It seems strange that the Portuguese should have been sceptical when they had already achieved so much, but their very successes seem to have induced a belief that the African route was the only one conceivable.

Columbus departed from Portugal to Genoa and Venice, but met with continual ill success until he turned his steps to Spain, where, by the good offices of the friar Juan Perez de Marchena, of the Convent of Santa Maria de Rabida, he ultimately obtained an introduction to the Sovereigns.

Ferdinand directed the most learned geographers and astronomers to meet Columbus at the famous conference which was held in the Dominican convent of St. Stephen at Salamanca, and here the most strange objections were raised against the scheme. The writings of the Fathers were shown to be decidedly against it ;

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[1] Washington Irving.

'Some cited old Lactantius: could it be
That trees grew downward, rain fell upward, men
Walk'd like the fly on ceilings?'[1]

But Columbus was able to meet these arguments with others equally cogent drawn also from the Fathers. One of the most extraordinary arguments brought forward by his opponents was that in the event of a vessel being successful in reaching the East by an ocean voyage westwards, it could never return, for the rotundity of the globe would present a kind of mountain up which it would be impossible for the vessel to sail.

1492. Nothing came directly of the conference, though some of its members seem to have been impressed by the marvellous enthusiasm of the Genoese sailor, and went away half believing in the possibility of the scheme. But Ferdinand was busy with his wars, and it was not until after the surrender of Granada that he consented to attend seriously to the foreigner with his vague idea and vast plans. At length, on April 17, 1492, the Sovereigns agreed to furnish him with two caravels, and Columbus was empowered to fit out a third, whilst certain privileges and titles over any lands he might discover were conferred upon him. The greater credit of this tardy response is due to the Queen Isabella, who had shown much favour to the plan, and had even offered to bear the expense herself.

A difficulty arose in fitting-out and manning the vessels, but eventually a wealthy and influential captain of Palos, Martin Alonzo Pinzon, came forward and offered to help in the equipment. August of that year saw the three vessels ready for sea; on one of them, the *Santa Maria*, a little larger than the others, Columbus hoisted his flag. Martin Alonzo Pinzon took command of the *Pinta*, and his brother, Vincente Yanez Pinzon, commanded the *Niña*. In all some 120 persons embarked. Among the sailors who accompanied the admiral on this first voyage 'it is interesting to find an Englishman from Lajes, a small place in Galicia, not far from Coruña. He is entered in the list as Tallarte de Lajes (Ingles). . . . There was also an Irishman among the crew, one William of Galway.'[1]

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[1] Tennyson, *Columbus*.

On the morning of Friday, August 3, 'one hour before sunrise,' as Columbus states, the little vessels set sail and steered for the Canaries, where they were delayed some three weeks in consequence of a defect in the *Pinta*, and it was not until Sunday, September 9, that the last glimpse of land faded from sight.

The course taken by the caravels on this voyage—destined to be the most famous in the history of the world—was at first due west, and though this course was slightly changed once or twice, Columbus persisted in holding to the western course, in spite of many entreaties to the contrary.

On the evening of September 13 Columbus noticed the curious and perplexing phenomenon of the variation of the needle. There has been considerable difference of opinion as to what Columbus really did notice on this occasion. His 'Journal' merely gives us the information that 'at the commencement of the night the needles turned a half-point to north-west, and in the morning they turned somewhat more north-west.' The opinion expressed by Sir Clements Markham[1] seems to be the most lucid and convincing of all—viz., that 'Columbus did not discover the variation of the compass on this occasion. It is scarcely credible that variation had not been remarked by the numerous intelligent seamen who had long used the compass in navigating the Mediterranean from end to end. What Columbus did discover was far more important. This was the change of variation from easterly to westerly after crossing a point of no variation.'

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[1] Sir Clements Markham, *Life of Columbus*, p. 69.

The line of no variation swept past the western side of the Azores at that time, and it was in the longitude of these islands that the vessels had crossed it. Columbus endeavoured to satisfy the sailors that there was no cause for alarm in the strange behaviour of the needle ; and although he himself was at a loss to account for it, he told them that the pole star, instead of being stationary, was in reality describing a small circle.

Throughout the voyage the sailors were continually murmuring at the risk and the unknown terrors that confronted them ; and in order to allay their fears as much as possible, Columbus, whilst keeping for his own private use an accurate account of the distance sailed, at the same time adopted the expedient of keeping another record for the inspection of the crews, in which a certain amount was deducted each day, so that they might not be alarmed by a knowledge of the actual number of leagues separating them day by day from their homes. It was a pious fraud.

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[1] *Life of Columbus*, p. 76.

A reward had been promised to the one who should first sight land, and there were days when the reward looked close at hand from the many indications of land. The first actual proof of the nearness of land was discerned late in the evening of October 11 by Columbus himself, who perceived a light glimmering in the distance.

A sailor on board the *Pinta*, named Rodrigo de Triana, actually first saw the land at two o'clock on the following morning, Friday, October 12, and the discovery was announced by the firing of one of the *Pinta's* guns. The ships lay to, after a voyage of thirty-five days, every one on board anxiously awaiting the dawn.

'The thoughts and feelings of Columbus,' says Washington Irving, 'must have been tumultuous and intense. At length, in spite of every difficulty and danger, he had accomplished his object. The great mystery of the ocean was revealed; his theory, which had been the scoff of sages, was triumphantly established; he had secured to himself a glory durable as the world itself. It is difficult to conceive the feelings of such a man at such a moment, or the conjectures which must have thronged upon his mind as to the land before him, covered with darkness.'[1]

'So awhile
He watched the dim sea with a deepening smile,
And felt the sound and savour and swift flight
Of waves that fled beneath the fading night
And died before the darkness, like a song
With harps between and trumpets blown along

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[1] *Life of Columbus*, vol. i. p. 152, 1885 ed.

Through the loud air of some triumphant day,
Sink through his spirit and purge all sense away
Save of the glorious gladness of his hour
And all the world about to break in flower
Before the sovereign laughter of the sun.'[1]

We can imagine the sunrise on that memorable morning. Three little boats riding at anchor off an island, which the first rays of the 'sovereign laughter' of the sun reveal verdant and beautiful. Seabirds are wheeling overhead heedless of the intruders, but on the shore human beings are assembling to watch the strange birds, floating on the sea, which now spread their wings and sail towards the island. The *Pinta* leads, and her crew are raising the 'Te Deum.' The crews of the *Santa Maria* and the *Niña* join in the solemn chant, and many rough men brush away tears. Columbus, the two Pinzons, and some of the men step into the cutter and row to the shore. A large cross is set up, together with the standard of Spain ; thanks are offered to God, and the sailors are crowding round their leader, some to beg forgiveness, others to vow fidelity, and all to praise him. Columbus names the island San Salvador, and formally takes possession for Spain.

The island was one of the Bahama group, and has been identified as that now known as Watling Island. The natives called it Guanahani. All the natives with whom the Europeans came into contact on this first voyage were harmless and friendly, and lived a life of extreme simplicity. They were of moderate stature well formed, and generally of a dark copper hue. They went entirely naked, and most of them were curiously painted either on the face or over the entire body. Such weapons as they possessed were not very formidable. A stick of hard wood tipped with the bone of a fish formed their most deadly weapon. Iron was quite unknown to them; some handled the bright steel of the Spanish swords in entire ignorance of a cutting edge. The natives, however, soon learnt the use of a sword, to their cost. That Columbus thought he had reached the Indies is well known, and the name of Indians bestowed generally on the natives of the lands where he touched has been extended to all the original inhabitants of North and South America.

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[1] Swinburne, *Tristram of Lyonesse.*

Several small islands were visited in the course of the next few weeks, as well as the large islands of Cuba and Hayti, the latter of which Columbus named Hispaniola. There were two incidents that occurred on this voyage soon afterwards which had the effect of accelerating his return to Spain.

On November 20 the *Pinta*, in command of Martin Alonzo Pinzon, drew away from the two other vessels in search of a vague land of gold which the natives had reported, to the great discomfort of the admiral, who grieved at the defection, not knowing to what it might lead.

A worse disaster occurred off the island of Hayti on the Christmas Eve, when, owing to the negligence of those in charge at the time, the *Santa Maria* was wrecked on the shoals off the island, and Columbus was left with only the little *Niña* to continue his voyage and carry him back to Europe. He called the spot where this had happened La Navidad, or the Nativity, in thankfulness for his escape from the wreck on Christmas Day. Out of this incident arose the perplexing task of carrying a double crew in one small vessel over the great expanse of the Atlantic. The result was that many begged to be allowed to remain on the island where life was so easy. A fort was constructed on the coast with materials from the wreck of the *Santa Maria*, and thirty-nine men, under the command of Diego de Arana, were left to traffic with the natives and obtain a supply of gold, whilst Columbus and the others returned to Spain to report the great news and obtain fresh vessels and supplies. Everything being completed, he set sail on his homeward voyage on January 4.

On the 6th they fell in again with the *Pinta*, and Columbus appears to have forgiven Pinzon for his desertion. The *Pinta*, however, again parted company before reaching Spain, being separated from the *Niña* in a violent storm which they encountered in mid-ocean on February 13. She was driven northward into the Bay of Biscay, and at length arrived at the little port of Palos, some hours after the *Niña*, on March 15, 1493. The story goes that the great honours conferred upon Columbus preyed upon the mind and health of Pinzon, who was debarred from sharing in the rewards of the voyage on account of his conduct in the Caribean Sea, and that in a few days he died. His untimely and painful end is to be greatly deplored, for he had rendered valuable assistance in the undertaking, and we cannot help feeling that Fate was rather unkind to him.

The 'Catholic Sovereigns' were only too glad to confer honours and privileges on the man who had added so much to the glory of Castile and Aragon, and they lost no time in preparing a second fleet to return to continue the enterprise.

Gradually—for news travelled slowly in those days—the wonderful story spread over Europe, and in London and at the Court of Henry VII. the tidings caused a great deal of wonder. Yet, though the discovery created such amazement, no one imagined that a new world had in reality been found. It was universally understood that the Indies had been reached by a voyage to the west.

But before despatching a second fleet, Ferdinand sent ambassadors to the Holy Father asking that the rights of Spain in the new lands might be placed upon the same footing as those of the Portuguese in Africa. This was granted, and on May 3, 1493, the famous bull of demarcation was issued. The Papal Court, foreseeing that the interests of Spain and Portugal might clash in this new work with which both countries were now identified, cut the matter short by drawing an imaginary line from pole to pole, passing a hundred leagues to the west of the Azores and Cape Verde Islands. Portugal might retain her privileges over all lands to be discovered to the east of this line, whilst Spain was free to push her discoveries to the west.

The geographical knowledge of the authors of this scheme was peculiar. The Azores and Cape Verde Islands were deemed to be on the same meridian, and the sphericity of the earth was but imperfectly understood, if at all, since if it had been understood the possibility of the rivals pushing on east and west until they met on the opposite side of the globe must have occurred to them. It shows that the globular idea of the earth, the fundamental idea on which Columbus had based his plans, had not been as yet fully assimilated.

By September of the same year the preparations for the second voyage were completed, and on the 25th of that month the fleet set sail. It consisted of fourteen caravels and three large ships known as carracks. 1493

On Sunday, November 3, the vessels arrived at an island, to which Columbus gave the name Dominica. It was one of the numerous Caribbean group, the Antilles, and in succession the islands of Guadeloupe, Montserrat, Santa Maria la Redonda, Santa Maria la Antigua, San Martin, Santa Cruz, and others were either visited or passed.

Porto Rico was found, and its beauty admired, and on November 27 the fleet arrived off Hispaniola, where the little fort had been established. It was found that disaster had overtaken the garrison, and that not one Spaniard survived. Gradually the story was learnt from the friendly natives. Dissensions had crept in among the Spaniards, and the party had split up and separated. Some had gone off to a distant part of the island in search of treasure, and had suffered death at the hands of hostile natives, who subsequently attacked the remaining Spaniards in the fort and destroyed the village of the friendly natives.

Another spot some leagues distant was selected, and a town was rapidly built, to which the commander gave the name of Isabella.

Journeys were now made into the interior of the island in the hope of finding the gold mines of which the natives spoke; and after Columbus had made all arrangements necessary for the Spaniards in the new colony, he took three of the small vessels (as being more serviceable in entering river mouths and approaching closer in shore), and on April 24, 1494, continued his voyage of discoveries. The southern part of Cuba was coasted but not fully explored; and on May 3 Jamaica was first seen, the Spaniards as they approached being struck with its extreme beauty.

The ships sailed along the northern part of Jamaica and then returned to Cuba, where the numerous little islands, known as the Queen's Gardens, were met with, which was another instance that went to confirm the idea in the mind of the admiral that he had arrived off the coast of Asia, since both Marco Polo and Sir John Maundeville had spoken of the innumerable islands off the eastern coast of Asia; and Columbus thought he was now in the midst of these.

The coasting of Cuba was continued until the vessels arrived near its western extremity, when the difficulties of navigation increasing, and the condition of the ships having become very bad, the admiral decided to return to Hispaniola. Not only Columbus, but the commanders and crews of all three vessels, were convinced that they were coasting the continent of Asia, and they actually signed and attested a document setting forth their belief that Cuba was a continent!

The admiral, in securing such a document, shows his anxiety to have his (supposed) discovery well authenticated. Had the ships been taken a few leagues further to the west, the important fact of Cuba being an island could not have escaped notice. Columbus left the Cuban coast on June 13, and on the same day the island now known as the Isle of Pines was discovered. Crossing over to Jamaica again on July 22 he sailed along its northern coast, and then past the southern coast of Hispaniola to a little islet known as Mona, lying between Hispaniola and Porto Rico. Here he became seriously ill, and the vessels returned to Isabella after a voyage of some five months.

On recovering from his illness at Isabella, Columbus was overjoyed to see his brother Bartholomew, who had followed him from Spain.

The brothers had been separated for several years, for Bartholomew about the year 1491 had gone to England, in order to lay the great scheme of his brother before Henry VII. of England. It illustrates the state of the times when we read of Bartholomew being captured by corsairs, and that several years elapsed before he was able to reach England. There are some grounds for believing that he accompanied Diaz on the voyage in 1486 which resulted in the discovery of the Cape of Good Hope.

Bartholomew succeeded in making an arrangement with the English Court for carrying out his brother's scheme, and England might have shared in the glory of the first discovery of the New World, but it was already too late. Bartholomew, on journeying through France to seek his brother in Spain, learnt at Paris the result of his brother's first voyage.

Bartholomew was invested with certain powers by his brother, and after taking steps to ensure the tranquillity of the island, Columbus returned to Spain, partly for the purpose of dispelling charges that had been made against his administration. That he succeeded in dispelling those charges, and of clearing his character, was owing to the great respect he was able to inspire and to the ever friendly sympathy of Isabella.

The vessels returned from this second voyage in June, 1496; and it is sufficient proof that the reputation of Columbus had been already undermined by his enemies at Court when we find that the Sovereigns some twelve months previously had granted a general permission to their subjects to make voyages of discovery to the new lands. The effect of some of the voyages which were undertaken in accordance with this permission was, as we shall see, to diminish the glory of Columbus. It was an expensive matter to fit out more vessels, and it was not until May 30, 1498, that he again set sail. His fleet on this third voyage consisted of six vessels.

1498 On this voyage the admiral steered more to the south. Dividing his fleet on June 21 off the island of Ferro, three vessels were sent direct to Hispaniola with supplies for the colony, and with the other three Columbus continued his voyage.

On June 27 he touched at the Cape Verde Islands and then struck off in a south-westerly direction, until he fell in with the doldrums, where he was becalmed. Getting free from this embarrassment he kept due west until he thought he was near the Caribee Islands, when he changed the course to north, and on

July 31 beheld the island which he named Trinidad. Opposite the southern coast of Trinidad the mouths of the Orinoco were seen, but it was not known that they had their source in a great continent, although Columbus was struck with the quantity of fresh water which they sent into the Gulf of Paria, and he doubted if such great streams could issue from an island. Rather, he thought, the land must be some extension of Asia.

On August 14 the islands of Tobago and Granada were discovered, and during two or three days following many other small islands were passed. The further exploration of the coast was then abandoned owing to the ill-health of Columbus. As on the previous voyage along Cuba a continuance of this voyage must have been productive of great results, but Fate decreed it otherwise, and the fact that the coast-line stretching for miles to the west was really the northern seaboard of a great continent remained unknown. The ships were headed for Hispaniola, where they arrived on August 19.

It is not our purpose to follow the course of events upon this island; they are incidents in the history of early Spanish colonization, and are fully dealt with in the biographies of the illustrious discoverer.

It will be sufficient for our purpose to mention that great confusion arose in the colony in consequence of the disaffection of many of the Spaniards, and the difficulties connected with pacifying the natives. Vessels were despatched to Spain with reports of the state of the island; and the enemies of the admiral did not fail to make the utmost of every circumstance that tended to throw discredit upon the foreigner, as they preferred to call him. The result was that the infamous Bobadilla, 'one as ignorant and impolitic as a beast,' was sent out to take command, and Columbus and his two brothers were sent back to Spain in chains! Thus disastrously ended the third voyage of the man who had braved the unknown waste of the Atlantic and found a New World.

1499 Some few months before the departure of Columbus there had arrived off the coast of Hispaniola four vessels, commanded by one Ojeda, who had been with the Admiral on his second voyage. The vessels had been fitted out early in 1499 as a private enterprise, and despatched, under the licence granted in 1495, with the object of participating in the riches of the recently discovered Pearl Coast, as it afterwards came to be named. Besides Ojeda, the pilot Juan de la Cosa sailed as principal pilot, and a Florentine merchant named Amerigo Vespucci was also of the party. Such was the expedition which, 'by a singular train of circumstances,' as Washington Irving calls it, eventually gave Vespucci's name to the whole of the New World. The first suggestion to this effect came some eight years later when Martin Waldseemüller, writing his 'Cosmographia,' ventured to propose that, inasmuch as Amerigo Vespucci had been the first to prove that the newly discovered lands were really a New World, they should be called America in honour of him. Protests were raised, but the name caught the map-makers and they adopted it.

For the greater part of the voyage Ojeda's vessels sailed over the course already opened up by Columbus; but more than this was accomplished, for the adventurers sailed further south, and then pushed on to the

VASCO DA GAMA

west and discovered the Gulf of Venezuela, 'little Venice,' and reached to Cape de la Vela.

Several expeditions to the new regions were organised about this time and despatched by merchants and others. Four vessels, under the command of Vincente Yanez Pinzon, who had been with Columbus on his first voyage, sailed from Palos in December, 1499. Striking a more southerly course than any of his contemporaries, Pinzon discovered the mouths of the Amazon, and coasted as far as Cape St. Augustine.

Another expedition sailed from the same port shortly after Pinzon had started. It was commanded by one Diego Lepe, who was even more successful than Pinzon, for he succeeded in doubling Cape St. Augustine, and passing for some considerable distance to the south-west.

Nor was Spain the only country whose ships were penetrating into unknown seas. Their neighbours and rivals, the Portuguese, were again beginning to push their discoveries, and to look for a share in the trade and wealth of the East.

In 1497 Emanuel, king of Portugal, determined to send a fleet to the southern cape (the Cabo de boa Esperança of his predecessor) to find its way to India. Four vessels were accordingly fitted out and placed under the command of Vasco da Gama.

He was born about 1460, and, though we know nothing of his early life, it is clear from being given the command of men and vessels that he must have attained some reputation.

Hitherto the Portuguese in their voyages along Africa had for the most part hugged the coast, and never sailed far out to sea unless driven by stress of weather, and it was well known by report that the Gulf of Guinea was beset by calms, and currents, and contrary winds. Vasco da Gama determined to outflank these obstacles by taking his vessels straight across the Atlantic, from the Cape Verde Islands to the Cape of Good Hope. It was a bold idea, and boldly and successfully did the commander carry it out.

It illustrates the downright hardihood and 'grit' of these men, and the disregard of unknown adventures and dangers that might await them, when we read of the objects of barter with which the Portuguese had provided themselves. Wash-hand basins, scarlet hoods, silk jackets, pantaloons, hats, Moorish caps, glass beads, little round bells, tin rings and bracelets figure in the stock. Valuable articles in dealing with the negroes, but useless when taken to a great commercial country like India. But the Portuguese soon learnt the wants as well as the weaknesses of the great Indian peninsula. The immediate result of da Gama's voyage was to rob Venice of her mercantile superiority. The lucrative spice trade was largely diverted from its old overland route to Venice, and Portugal became the great market, to the advantage of her coffers. In a few years, too, the Portuguese under Albuquerque had not only effected a settlement in India, but had acquired a rich slice of territory.

The voyage was commenced from Lisbon on July 8, 1497, da Gama hoisting his flag on board the *San*

Gabriel. The vessels made a wide sweep into the South Atlantic after leaving the Cape Verde Islands, and, according to Barros, five months were spent before the African coast was seen again. The point where the vessels touched was the Bay of St. Helena, and here the stock of wood and water was replenished, da Gama himself going on shore to take the sun's altitude more accurately than it could be done on the deck of a little ship pitching and tossing in the midst of the Atlantic. Resuming the journey, the vessels reached the Cape of Good Hope in safety, encountering typical Cape weather on the passage,

> 'With such mad seas the daring Gama fought,
> For many a day and many a dreadful night,
> Incessant, labouring round the Stormy Cape ;
> By bold ambition led, and bolder thirst of gold '[1]

and then continued closely along the coast, arriving at Mozambique by March of the following year. The voyagers continued northwards to Zanzibar and Melinde, where the native king entertained them and sent two pilots on board to show the route to the Indian peninsula. The Portuguese were now in the midst of the Arab traders, and were the forerunners of the regular independent European traders who shortly afterwards followed in the wake of Vasco da Gama.

The fleet now struck across the Indian Ocean, arriving at Calicut in India on May 20, 1498, or, according to Gaspar Correa, on August 26, for the two accounts are at variance. In returning, da Gama followed his outward route, until the Cape of Good Hope was passed in March, 1499, when a direct course was steered for Cape Verde, the fleet arriving at Lisbon in the September following.

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[1] Thomson, *Seasons*, *Summer*.

This voyage, highly creditable, and depending for its success on bravery and enterprise, brought honours and fame to its commander; but it also added to the fame of Prince Henry the Navigator, since it marked the final success of the great undertaking to which he had nobly devoted his life.

1497 Contemporary with the voyage of da Gama, England had entered the new field of enterprise. In March of 1496 a licence had been granted by Henry VII. to John Cabot, citizen of Venice. 'Henry, by the grace of God,' so runs the licence, 'king of England and France, and lord of Ireland, to all to whom these presents shall come, greeting. Be it knowen that we have given and granted, and by these presents do give and grant for us and our heires, to our well-beloved John Cabot, citizen of Venice, to Lewis, Sebastian, and Sanctius, sonnes of the said John, to seek out, discover, and find whatsoever isles, countries, regions, which before this time have been unknown to all Christians.'[1]

The expedition sailed in the year following, setting out from Bristol, passing Ireland, and striking out bravely to the west. Unfortunately there are very few authentic particulars of this (to us) most interesting voyage. No journal, like that of Columbus, appears to have been kept by John Cabot. The entire voyage occupied little over three months, but in that short time Cabot succeeded in finding the coast of North America, or eastern Asia as he considered it, and bringing home the news to England, together with a few tokens from the distant lands. There has been much controversy as to the exact point where he first sighted the North American continent, as well as to the extent of coast actually explored. It is probably not far wrong to place his landfall on the coast of Labrador. That he had arrived at the eastern parts of Asia was assumed without any doubt, and such was the report made to the king, and generally understood in England. Cabot himself prepared a chart showing his course, and the points where he had landed in Asia! The son, Sebastian Cabot, has generally been credited with a share, at least, in this first voyage, but modern researches tend to show that the credit of the undertaking is entirely due to the father.[1] There is even some doubt as to whether Sebastian took part in this first voyage at all. In after years the son was unfilial enough to claim the whole credit to himself.

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[1] Hakluyt, *Principal Navigations*.

By May of 1498 John Cabot had started on his second voyage of discovery with four or five vessels; and this time the extreme north-west was selected as the point towards which the ships were to be taken, in the hope of finding a route in this neighbourhood leading to India and the Spice Islands. But in this he met with disappointment. Still, the voyage was a remarkable one. Foiled in the more northerly latitudes, Cabot turned south. The Atlantic seaboard of North America was coasted almost as far as Florida, and Cabot was back in Bristol by the end of the year, spreading the story of the discoveries. Yet the spirit of emulation remained practically dormant in England. The north-west passage remained undiscovered, to the disgust of the Bristol merchants, who had hoped to derive profit by a new trade route ; and no gold or gems were brought back to dazzle the eyes of the King and his courtiers.

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[1] See Beazley, *John and Sebastian Cabot*, p. 55 *et seq.*

After this voyage John Cabot practically makes his exit. We hear nothing more of him ; he died probably in a year or two afterwards.

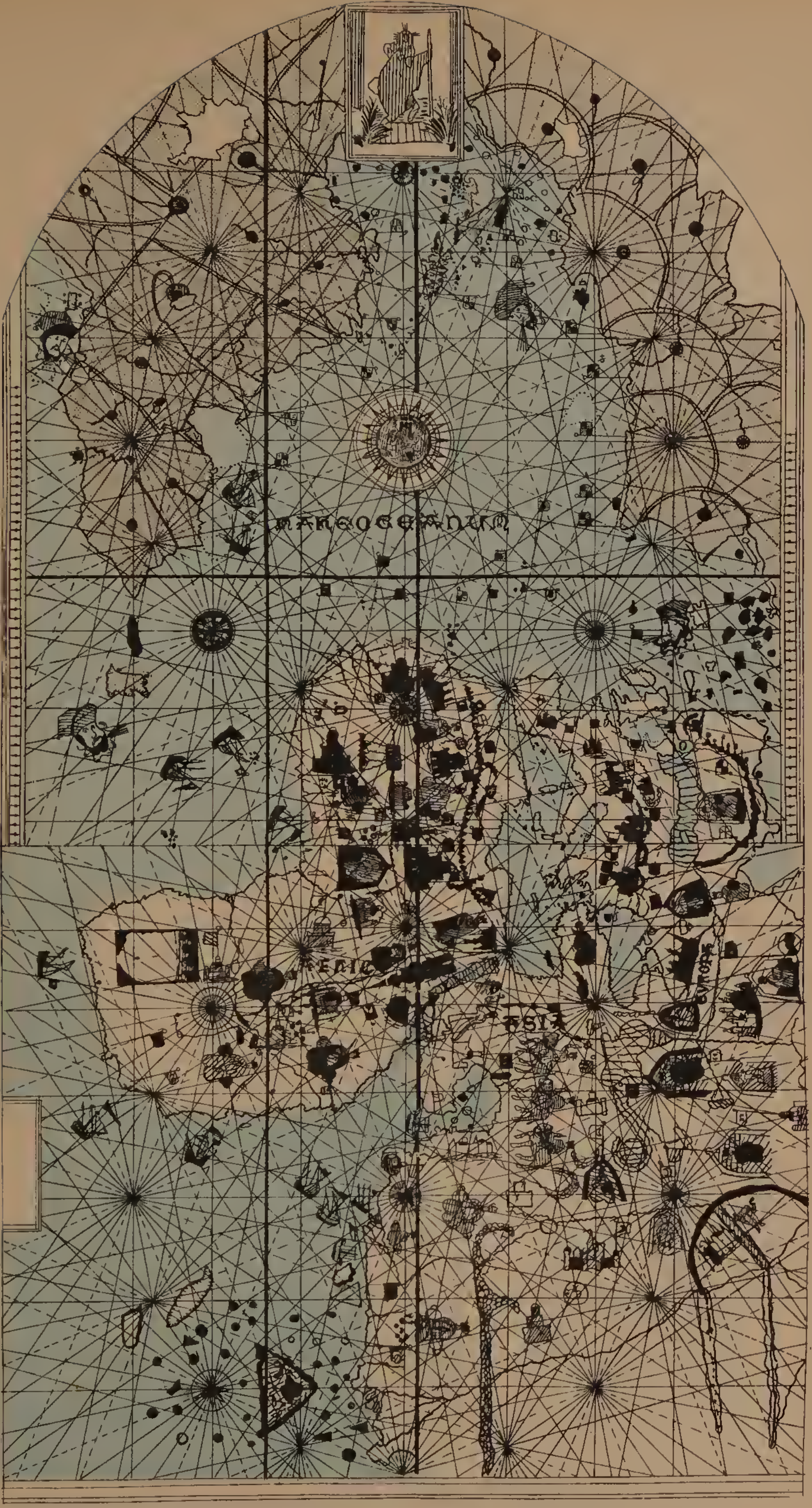
The dawn of the sixteenth century finds Spain and Portugal eagerly carrying on the work of discovery. England has not yet come into line. Nor for nearly fifty years do we see any sustained activity in English exploration. **1500**

But six months had elapsed since the return of da Gama to Portugal from his famous Calicut voyage when his vessels were again ready for sea. Thirteen vessels in all were fitted out, and sailed on March 9, 1500, under the command of Pedro Alvarez de Cabral. Again, like da Gama, in order to avoid the calms in the Gulf of Guinea, he decided to give that neighbourhood a wide berth by keeping well to the west. But he went more westerly than Vasco da Gama had gone, and on April 25 land was seen on the west, where no one had suspected its existence. The vessels coasted the land for some time, until Cabral became convinced that it must be part of a continent, and a vessel was accordingly sent back to Portugal with the important news of the discovery of the Brazils. Whether this discovery was the result of a fortunate accident, or was really a part of the business of the expedition, is a little doubtful; but it seems tolerably certain that no news of the discoveries of the Spaniards Pinzon and Lepe could have reached Portugal before the sailing of Cabral's vessels.

Later in the same year a Spanish expedition, under Roderigo de Bastides, set sail for the West Indies, and explored the Venezuelan coast to the west as far as a harbour, which Bastides named Puerto del Retrete, in the Gulf of Darien. The pilot Juan de la Cosa accompanied this expedition, and he has the distinction of having prepared the first chart of the New World. But a more important expedition had been planned by Portugal just previously, when Gaspar Cortereal was given command of a vessel with orders to proceed to the north-west.

Sailing from Lisbon in the summer of 1500, he took his vessel as far north as Greenland, coasted the island of Newfoundland, calling it 'Terra Verde,' and probably explored the coast of Labrador as well. The result of the voyage was so gratifying to the King of Portugal that he directed preparations for another voyage to be commenced immediately. It was hoped that a new route would reward the navigators, and that Spain might be outflanked. The new expedition, consisting of three vessels, set out in April of 1501, but was most unfortunate. The vessels became separated; two returned to Portugal in the November following, but the one with Cortereal on board was never heard of again. The report of those who returned, however, was clear that many hundreds of miles of coast line had been explored.

MAP OF THE WORLD, 1500. by Juan de la Cosa.



Stanford's Geog^{l} Estab^{t}, London

London: Edward Stanford, 26 & 27, Cockspur St., Charing Cross, S.W.

Thus was the knowledge growing that the new lands in the west were of far greater extent than had been suspected at first.

Meanwhile, how was Spanish exploration progressing? Columbus, although nominally restored to favour, had been given no further command, and if his titles and dignities had not been actually taken from him, they were at all events in abeyance. But the spirit of maritime enterprise which his voyages had kindled was every day becoming stronger, and he beheld crowds of nobles and adventurers setting out for the new lands and reaping rewards which by right should have been his.

The stirring news of the successful voyage of da Gama and the voyage of Cabral—which had been a highly profitable one—gave a fresh stimulus to Columbus. He approached his royal master and mistress; Isabella was touched by the appeal of her faithful servant, and succeeded in persuading Ferdinand to accede to the admiral's request to send him on another voyage. The influence at work on the mind of the King was the alluring prospect of finding a shorter route to India than the Portuguese route *viâ* the Cape of Good Hope.

It seemed to Columbus that there must exist a passage somewhere near his 'Indian' islands by which India could be reached; and it was with the object of finding this opening or strait that the new expedition was prepared.

On May 9, 1502, four little caravels set sail from Cadiz. The Atlantic was crossed in most favourable **1502** weather, and everything promised well. The voyage, however, was destined to end in disaster : it was to close the labours of its illustrious commander.

The Windward Islands (as they are now called) were reached by the middle of June, and the vessels were taken along past the Leeward Islands, Porto Rico, Hispaniola, Jamaica, and part of the southern shores of Cuba, and from thence across to the coast of Honduras. Arrived here, Columbus changed his course so as to follow the coast towards the east, for he was bent on finding the strait. The natives spoke of rich lands to the west, but the admiral was not to be tempted from his purpose by gold, and the vessels turned eastwards. Again the baffling undercurrent of ill fortune beset him. The west was teeming with rewards for him, yet his inscrutable destiny turned him from them. 'Within a day or two,' says Washington Irving, 'he would have arrived at Yucatan ; the discovery of Mexico and the other opulent countries of New Spain would have necessarily followed ; the Southern Ocean would have been disclosed to him, and a succession of splendid discoveries would have shed fresh glory on his declining age, instead of its sinking amidst gloom, neglect, and disappointment.'

The coasts of Honduras, Costa Rica, and Veragua were searched for the imaginary opening, but without result. At the isthmus of Darien the admiral gave up the search, and returned to the coast of Veragua.

Disaster followed on disaster. By April of the following year he had lost two ships, and the remaining two were little better than hulks. Columbus and many of the crew were sick, provisions were scarce, and there was no alternative but to sail for Hispaniola. A continuance of stormy weather rendered the vessels quite unsafe, and as a last expedient they were deliberately run aground on the coast of Jamaica, and firmly lashed together.

The story of the ultimate rescue of the party is one of noble fortitude on the part of Columbus, marvellous courage on the part of Diego Mendez, who travelled in an open canoe to Hispaniola to carry the news and beg for relief, and of base ingratitude and heartlessness in Ovando, the governor of Hispaniola, who delayed to send aid. A year elapsed before the admiral and his crews were rescued from their precarious situation.

After the return of Columbus to Spain in 1504, it was found that by a curious coincidence the search for the strait had been given up by Columbus, sailing eastwards, at the very place where the expedition under Bastides, sailing westwards, had stopped. Thus the whole of the northern coast of the continent of South America from Cape Saint Augustine, nearly 10° south of the equator, to the Gulf of Darien had been opened up.

The lifework of the 'greatest navigator in history' was finished. He died at Valladolid on May 20, 1506. Of his services to humanity little more need be said. His memory is immortal.

The generally received opinion at this period was that he had succeeded in finding the eastern parts of Asia by sailing westwards. Columbus himself died in this belief. 'It was only when, on the one hand, the work of Gama and Albuquerque had begun to give a definite outline to the (east) Indies, and, on the other, when each western-sailing navigator found land at whatever latitude he might choose to cross the Atlantic, that the European world realised the existence of a new continent, and realised it as a vast interminable barrier which stretched apparently from pole to pole.'[1] The belief of Columbus and his contemporaries that he had reached the Indies, and that Japan was to be found in the regions occupied by the West Indies, is really an appalling error, and it does illustrate how vague were men's notions of the earth they possessed. No one as yet dreamed that a vaster ocean than the Atlantic separated the New World from Marco Polo's Cipangu. This was suspected, though not fully realised, when, in 1513, the narrow but dangerous Isthmus of Darien was traversed and another great ocean came into view.

A small colony had been established by the Spaniards in Darien, and among the settlers was one Vasco Nuñez de Balbao, 'the man who knew not what it was to be deterred.' He had attained to some command over his companions, and hearing from the natives reports of a great sea across the mountains, he selected some two hundred men and determined to make an attempt to find it.

The journey was commenced in September 1513, Nuñez with his men sailing from Darien to Carreto, where the land journey was begun. So many difficulties beset the explorers that twenty days were occupied in forcing a path from Carreto to the mountains. The summit was gained at length, however, and the glorious prospect that burst on the view of the travellers was sufficient recompense for all their hardships. An extent of wooded country stretched before them, with streams running down to the great sea which lay glittering in the distance. The adventurers continued their journey to the sea, and when they had arrived at the shore, at the Gulf of San Miguel, Nuñez, drawing his sword, waded into the water and claimed possession of the ocean for Spain. The band had descended the mountains from the north, and the sea appeared stretching out to the south; it received, therefore, the name of the Southern Ocean.

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[1] Guillemard, *Life of Magellan*, p. 92.

And now discovery began to make great strides. Spanish sailors and adventurers continued to flock to the regions opened up by the voyages of Columbus.

As we have seen, the northern coast of South America had been visited, and within a short time the Spaniards had pushed their inquiries as far south as the Rio de la Plata. In October 1515, Juan Diaz de Solis 1515 had been despatched with instructions to search for a possible western route to the Indies. He sailed down the South American continent as far as the mouth of the Rio de la Plata, where he met his death in a skirmish with the natives; and the ships then returned to Spain without attempting to prosecute the search further. Thus, so far, every attempt to find the suspected opening was futile.

CHAPTER VIII

MAGELLAN AND THE FIRST CIRCUMNAVIGATION OF THE GLOBE

ON our long journey down the ages we have passed in review many notable men, men whose names were destined to acquire such fame that even old Father Time, in whose bosom so many great and noble men and women slumber unknown, has been constrained to yield them immortality. Not the least among the immortals is Ferdinand Magellan, to whom we assign the honour of being the first circumnavigator. His position is unique. Tradition, fable, and legend, always ready to detract from the fame of a discoverer by a story of a prior discovery years before, remain silent when confronted with the story of Magellan and his claim to be the first who circumnavigated the earth. Let us now examine his claim.

Ferdinand Magellan—or rather Fernao de Magalhaes, to call him by his Portuguese name—was born in 1480 at Sabrosa in Portugal.

The details of his early life are meagre and uncertain. He came of a good family and naturally took up a career of arms. At the age of twenty-four he volunteered to serve in a great armada fitting out for India. But besides military service for Portugal under such leaders as Almeida and D'Albuquerque, he acquired a knowledge of the art of navigation. It is also said that he applied himself closely to the study of cosmography during his leisure time, and became highly skilled in this as well as in astronomy and geography.

MAGELLAN

He was essentially the man of action, a tried soldier, a leader of men; and, qualified by his voyages and studies to navigate a vessel, he looked for a great enterprise in which to distinguish himself.

His adventures in the East had already led him to the distant Moluccas, the 'Spice' Islands, and, like his illustrious predecessor Columbus, he may have entertained the idea of seeking a western passage to the Indies long before he was able to put it into practice.

He was thirty-seven when he laid before the King of Portugal his project of exploring the South American continent for the opening into the great Southern Ocean. We have seen how attempts had been made to find the suspected opening, and how near some had been to finding it. What led Ferdinand Magellan to conceive the project?

The question of the information, if any, on which Magellan based his plan is discussed at length by Dr. Guillemard in his 'Life of Magellan,' and after a masterly summary of the pros and cons he says: 'The balance of evidence is in favour of a more or less inexact knowledge of the existence of some antarctic break in the vast barrier which America opposed to a western passage.'

All attempts to find an opening or channel in northern latitudes had failed. The voyages of Cabot and Cortereal, besides many others, had succeeded in proving the vast extent of the North American continent, but no inter-oceanic strait had been disclosed. Moreover, the fact that the African mainland terminated in a southerly cape seems to have suggested the idea of a similar southerly ending to the South American mainland ; and as all previous voyagers to South America had reported a steady trend to the south-east, it was naturally selected as the more promising region in which to look for the imagined opening.

Magellan, inured to dangers of all kinds, could imagine nothing which should deter him from finding the opening, if such existed ; and he thought the time had arrived when his many services would be rewarded by an independent command. But 'put not thy trust in princes' was forced upon Magellan when the king, owing to some slight irregularity, real or imaginary, on the part of his servant, absolutely refused to have anything to do with the scheme and dismissed Magellan 'with a frown.'

The disappointment of this interview rankled in the soldier's mind. From the king's behaviour it was clear that a prospect of promotion even was vague, and that all notion of a separate command for independent discovery was out of the question. Magellan therefore decided to abandon Portugal and offer his services to Charles V. of Spain. That Magellan left his native land full of bitter feelings is clear from the act of public denaturalisation which he made before quitting Portugal.

In after years, when the fame and achievement of Magellan might well have wiped out the memory of this episode, Portugal continued to revile the memory of her great son. It is said that the coat of arms carved in stone over the ancestral home at Sabrosa was ordered to be erased, so incensed was the Court at finding Magellan in the service of a rival power.

In Spain Magellan fared better with his scheme. It was taken up warmly by the young king and his councillors, and orders were given to prepare vessels for the undertaking.

There was much delay from various causes, but at length, on September 20, 1519, the voyage was actually commenced, from St. Lucar, just below Seville. **1519**

The fleet consisted of five vessels—the *Trinidad*, of 110 tons, on which the commander sailed; the *San Antonio*, of 120 tons; *Concepcion*, 90 tons; *Victoria*, 85 tons; and the *Santiago*, a little craft of 75 tons. The crews were mostly Spaniards, but there were sailors of other nationalities, including an Englishman, 'a certain Master Andrew of Bristol,' who shipped as chief gunner on the *Trinidad*. The Englishman, however, was not fortunate enough to be among those who completed the entire voyage, for he died in March 1521, just after the fleet had reached the Ladrone Islands.[1]

Minute particulars of the outfit of the fleet have been preserved. Among the list of charts and nautical instruments, mention is made of six wooden quadrants, one wooden astrolabe, a planisphere, and six metal astrolabes. Compass-needles, compasses, and hour-glasses also figure in the list.

The fleet sailed to the Canaries, where the stock of water and wood was added to, and then continued down the African coast; but, owing to the very bad weather encountered, it was not until the end of November that Cape Saint Augustine on the South American coast came in sight.

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[1] Guillemard, *Life of Magellan*, p. 226

The route was now close to the land. Shortly after Christmas the vessels reached the mouth of the Rio de la Plata (then known as the Rio de Solis, after Juan de Solis, who had perished there), and it was examined in the belief and hope that it might prove to be the longed-for strait. Finding it to be but a river's mouth, the voyage was continued southwards. We can imagine to some extent the slow process of this coasting voyage, along unknown shores where Europeans had never been before. But in addition to the anxiety of Magellan there was now added that of mutiny among his captains. The indomitable will of the commander was equal to this emergency, as it had been to others in his life, and he succeeded in quelling the disturbance.

The cold was now beginning to be felt, and from the end of March to the beginning of August the vessels sheltered in a harbour which Magellan named Port St. Julian. The little *Santiago*, whilst sailing on in advance to explore the coast, at the end of April had been wrecked.

On August 24 the vessels left the harbour and resumed the journey to the south, creeping along, as before, in sight of the coast. After two days' sailing they reached the Bay of Santa Cruz, and remained for two **1520**
months, though had the commander known what a few days' sailing would reveal, he certainly would not have remained inactive during this period. On October 18 the sails were hoisted again, and on the 21st Magellan sailed into the long-sought-for strait. Whilst the flagship sought an anchorage, two vessels were sent forward to examine the channel. The vessels returned without loss

of time, and reported that the channel was narrow but deep so far as they had gone, and that it appeared to be continuous. The fleet accordingly sailed on, feeling and groping its way amidst islands and shoals and storms towards the outlet. The passage of the strait occupied more than a month ; it was not until November 28 that the great Southern Ocean was entered. But the fleet was now reduced to three. The wreck of the *Santiago* had been the first loss, and the *San Antonio* was no longer with the other vessels. The pilot and crew mutinied and deserted whilst in the Strait, and turned back to Spain to spread evil reports of the commander. It was a serious loss to Magellan, but he determined not to be thwarted by it. The stock of provisions, too, had become alarmingly reduced, nor could it be added to ; wood and water were the only things that the crews were able to procure on the wild Patagonian coast. Magellan, in spite of all this, expressed his resolve to push on and find the Moluccas.

The change from the narrow strait to the open expanse of the ocean was a great relief, the storms had all been left behind, and the peaceful aspect of the unknown waters on which the ships steadily sailed gave the new ocean its name of peaceful, or Pacific.

The vessels kept northwards near the coast until about the middle of December, when they turned away to the west, and commenced in real earnest the voyage across the Pacific, and for forty days no land was seen. By the end of January the vessels had passed a few islands, mere fragments, uninhabited and containing no fresh water.

Scurvy in a bad form was rife amongst the sailors; 'the upper and lower gums of most of our men grew so much,' says Pigafetta, 'that they could not eat, and in this way so many suffered that nineteen died.'

Starvation was actually staring the crews in the face. The biscuit was reduced to a powder, and full of grubs; the water was vile. Pigafetta's account is prosaic enough, but reveals a fearful state of affairs. 'We also ate,' he says, 'the ox hides which were under the main-yard, so that the yard should not break the rigging: they were very hard on account of the sun, rain, and wind, and we left them for four or five days in the sea, and then we put them a little on the embers, and so ate them.' Rats also became a costly delicacy.

There are not many details of this marvellous voyage across the immense expanse of the Pacific, but from such as we have we can imagine what the voyage was like. An unknown ocean lay stretched before the travellers day after day, unbroken save by a few specks of land, as we have seen, for more than three months; the barest necessaries of life reduced to a mere mouthful a day, and in danger of failing entirely; Magellan, steadfast and inflexible, keeping his course, like Columbus, steadily to the west, and so attentive to his work as to note variations in his compasses and make allowances for the variation.

It was not until March 6 that the suspense of the men was ended. They reached a group of islands, and fresh supplies were secured; but the natives were such thieves that the sailors called the islands the Ladrones, or 'Robber' Islands. Ten days later the Philippines were reached, and cordial relations were established with the king of Sebu, bartering was commenced, and practically the whole island became Christian, receiving baptism at the hands of the Spaniards.

Magellan, desiring to secure as much prestige as possible with a view to future intercourse with the islands, summoned the neighbouring tributary chiefs, and told them that they must render homage to the king of Sebu, for that otherwise the resentment of the Spaniards would fall upon them. One of the chiefs of a small island called Mactan was reluctant to accede to this, and Magellan determined to make an example of him. An attack was organised on April 27. Sixty men from the vessels set off in boats, accompanied by the king of Sebu and about a thousand of his men. But the resistance was fierce, and the battle went all against the Spaniards. Magellan fell mortally wounded, besides eight others ; the rest, wounded and exhausted, had the utmost difficulty in getting away.

The Spaniards were greatly depressed at the loss of their commander, and to add to their difficulties the king of Sebu became suspicious, and basely gave orders to assassinate twenty-seven of them, whom he had invited to land on the pretext of receiving presents for the king of Spain. The survivors hastened to quit the scene of so many misfortunes ; but they found on getting under sail that the *Concepcion* was so faulty that it was decided to tranship her stores to the other vessels and then burn her, which was accordingly done. The two remaining vessels, the *Trinidad* and the *Victoria*, continued their course among the islands to Borneo, visiting the town of Brunei, and then pushing on till at length on November 8 they anchored off Tidor in the Moluccas. Here fortune smiled on the voyagers. They were treated kindly, and succeeded in taking in a great cargo of nutmegs, cloves, cinnamon, mace, and so on. At the moment of leaving it was found that the *Trinidad* was so leaky that to attempt to sail her was useless, and it was agreed that the *Victoria* alone should sail for Spain with her valuable cargo, leaving behind the *Trinidad* and her crew. The *Trinidad* had nearly ended her career. After the departure of the *Victoria* an attempt was made to sail her to Panama, but, owing to bad seamanship and her faulty condition, it was found impossible, and she returned to the Moluccas.

On December 21 the *Victoria* weighed anchor and stood out to sea, under the command of Sebastian del Cano, bearing to the south-west and sailing very near to the unsuspected continent of Australia.

Of the subsequent brave passage of the Indian Ocean by del Cano and his companions little need be said. The African mainland came in sight on May 8 in the following year (1522). The Cape of Good Hope 1522 justified its first name of the Stormy Cape, but they rounded it safely and stood northward, arriving at the Cape Verde Islands on July 9, and were rewarded by seeing the shores of Spain shortly afterwards. On September 8 the *Victoria* dropped her anchor off Seville. 'The first circumnavigation of the globe was accomplished, and a voyage brought to a conclusion which was, and is, without parallel in the history of determination and suffering, disaster and success.'[1]

With regard to the date of the return to Seville, a curious incident occurred. The sailors when they landed were told that the day was September 8, but they were positive that according to their reckoning it was the 7th, and it was some time before it was perceived that the discrepancy arose from the fact that the voyage had been made to the west, and that therefore the crew had 'lost' a day. As a matter of fact, it took many years before any arrangement was made for dealing with this simple phenomenon. The 180° of longitude is now generally regarded as convenient for either adding or dropping a day, according to whether the ship is sailing west or east.[2]

Such, then, was the voyage which deservedly ranks among the greatest that have ever been accomplished—a voyage without parallel in the previous history of mankind. The death of Magellan, before he had completed the entire circumnavigation of the globe, prevented him from seeing the fruits of his work ; but death was unable to rob the commander of the fame which was awarded him when the stupendous results of his voyage were realised. He had earned undying fame.

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[1] Guillemard, *Life of Magellan*, p. 294.

[2] Many attempts have been made to overcome the difficulty, and obviate the confusion that occasionally arises from the 'change of day.' Although the 180th meridian is generally convenient for adding or dropping a day by mariners moving westwards or eastwards across that meridian, many of the Pacific islands to the east of the 180th degree keep Australian time.

The humorous aspect of the conflict arising from the neglect to allow for the 'change of day' has been turned to account by Bret Harte in *The Lost Galleon*:

'My pilot is dead of scurvy: may
I ask the longitude, time, and day?'
The first two given and compared;
The third,—the commandante stared!
'The *first* of June? I make it second.'
Said the stranger, 'Then you've wrongly reckoned.'

What were the results of his voyage? The first result was, of course, the knowledge of the Strait which since bears Magellan's name. The key to the East had been found ; it only remained to make use of it. But the voyage had accomplished more than this : it had disclosed the existence of many large, rich, and populous islands in the East, and the word Indies was seen to be a term of even larger significance than had hitherto been suspected. The wealth and magnificence of the East, tested and confirmed by actual contact, were open to Spain as well as Portugal, and two distinct routes now lay open. But Spain and Portugal were not the only nations whose flags were to float in the East. France and Holland were to participate in the golden harvest of the Orient ; and French and Dutch navigators were to rank among famous discoverers ; and England, when fully roused, took her place as Empress of the Seas. Before the sixteenth century closed, that marvellous renascent century of enterprise and expansion, the world rang with the exploits of Drake—the first English circumnavigator, and the first commander to carry his vessel round the world—Frobisher, Cavendish, Hawkins, Raleigh, heroes of Britain's Salamis, as Kingsley called the defeat of Spain's 'Invincible' Armada, and pioneers of English explorers.

But apart from these results of Magellan's famous voyage there were others highly valuable and equally important. The voyage demonstrated once and for all the circular shape of the earth ; and the distance traversed supplied a rough estimate of its size. It was not that the newly found lands were so accurately known that they could be defined and delineated on charts with absolute certainty. This was the work of time, and a very slow work it proved to be. At the present time, although geographical knowledge has acquired a high degree of perfection, it is not *quite* perfect, and there are still regions of the earth but dimly known.

We are able to judge what the world was like to geographers at this time from Johann Schöner's globe of 1523, the gores of which are reproduced in this volume. With Schöner's globe before us—a valuable pictured summary—it becomes impossible to conceive of geography growing dark again, and its history from this time, with a few possible exceptions, is one of continual advance and improvement.

The labours of explorers had not ceased when the *Victoria* returned to Seville ; far from it. There remained in the Old World the great African continent to penetrate, and the heart of Asia was but imperfectly known ; whilst in America Europeans had done no more than touch the shores of two vast continents. The Arctic and Antarctic regions were practically unknown, and the secret of the great land masses of Australasia was, as yet, closely kept by the ocean. But Magellan set geographical knowledge on a surer footing than it had ever been before. For it was a great gain to have learnt the earth's shape. True, men had believed in a spherical earth before, and, strictly speaking, Magellan's voyage did not prove so much as this—he might have achieved the same result by sailing round a drum-shaped earth—but the globular shape, and that alone, was the shape that men deduced from the voyage, and the conviction that had been slowly gaining ground now became a certainty, and, as if to set the matter at rest once and for all, the coat of arms granted to Sebastian del Cano had for the crest a globe, with the motto, 'Primus circumdedisti me.' Ferdinand Magellan and his brilliant voyage, therefore, had for ever dispersed the mist of doubt over this problem concerning the earth. The Greek philosophers were right, their theories were the true ones, and Magellan had proved them by his labours which form so marked an epoch in the Evolution of Geography.

APPENDIX

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